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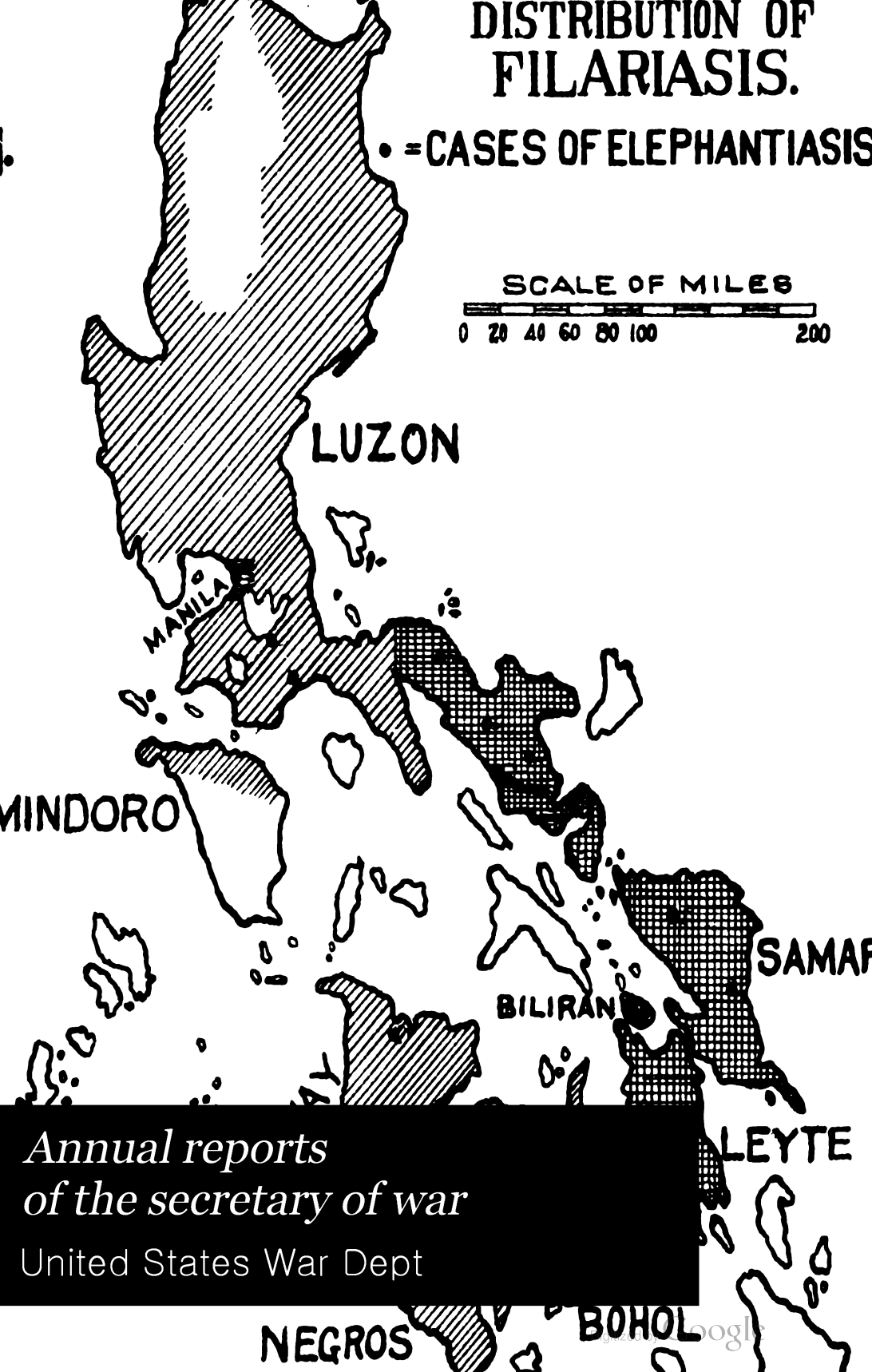
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FROM THE
UNITED STATES GOVERNMENT
THROUGH

WAR DEPARTMENT,

Annual Reports, 1909

(IN NINE VOLUMES)

Volume II

Reports of

QUARTERMASTER-GENERAL
COMMISSARY-GENERAL
SURGEON-GENERAL
PAYMASTER-GENERAL
CHIEF SIGNAL OFFICER
CHIEF OF COAST ARTILLERY



WASHINGTON
GOVERNMENT PRINTING OFFICE

1909

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11 27 1910

From the

U. S. Government

ARRANGEMENT OF THE ANNUAL REPORTS OF THE WAR DEPARTMENT FOR THE YEAR ENDED JUNE 30, 1909.

Volume I.....Secretary of War.
Chief of Staff.
The Adjutant-General.
Inspector-General.
Judge-Advocate-General.

Volume II.....Armament, Transportation, and Supply:
Quartermaster-General.
Commissary-General.
Surgeon-General.
Paymaster-General.
Chief of Engineers, Military Affairs.^a
Chief of Ordnance.^b
Chief Signal Officer.
Chief of Coast Artillery.

Volume III.....Division and Department Commanders:
1. Department of the East.
2. Department of the Gulf.
3. Department of the Lakes.
4. Department of the Missouri.
5. Department of Dakota.
6. Department of Texas.
7. Department of the Colorado.
8. Department of California.
9. Department of the Columbia.
10. Philippines Division.
11. Department of Luzon.
12. Department of the Visayas.
13. Department of Mindanao.
14. Army of Cuban Pacification.

Volume IV.....Military Academy and Military Parks:
Military Academy—
Superintendent.
Military Parks—
1. Chickamauga and Chattanooga.
2. Gettysburg.
3. Shiloh.
4. Vicksburg.

Volume V.....Chief of Engineers.

Volume VI.....Chief of Ordnance.

Volume VII.....Chief of Bureau of Insular Affairs, and The Philippine Commission.

Volume VIII.....Acts of The Philippine Legislature.

Volume IX.....Governor of Porto Rico.

^a Printed in Report of Chief of Engineers, Vol. V.

^b Printed in Report of Chief of Ordnance, Vol. VI.

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REPORT OF THE QUARTERMASTER-GENERAL.

REPORT OF THE QUARTERMASTER-GENERAL.

WAR DEPARTMENT,
OFFICE OF THE QUARTERMASTER-GENERAL,
Washington, November 1, 1909.

SIR: I have the honor to submit the annual report of the operations of the Quartermaster's Department for the fiscal year ended June 30, 1909.

FINANCIAL STATEMENT.

By acts of Congress and allotments there was credited to the regular service of the Quartermaster's Department for the year ending June 30, 1909, the sum of.....	\$39,621,972.51	
During the fiscal year there was deposited to the credit of appropriations from various sources as shown, the sum of.....	2,401,461.36	
Making total of.....		\$42,023,433.87
Of this there was remitted to disbursing officers.....	\$36,131,652.43	
There was paid on account of settlements made at the Treasury, etc.....	178,982.19	
		36,310,634.62
Leaving a balance on July 1, 1909, available for payment of outstanding obligations.....		5,712,799.25
On July 1, 1908, there was on hand from regular appropriations, for service of the Quartermaster's Department, pertaining to the fiscal year 1908.....	\$5,492,994.37	
From appropriations of other fiscal years including all indefinite appropriations.....	5,601,438.73	
For special purposes there was appropriated and allotted during the fiscal year ending June 30, 1909, the sum of.....	6,788,964.51	
During the fiscal year there was deposited to the credit of all appropriations (other than those of 1909 shown above) from various sources, the sum of	2,741,376.50	
		20,624,774.11
Of this there was remitted to disbursing officers.....	13,010,487.58	
Paid out on account of Treasury settlements, etc.....	869,248.19	
Carried to surplus fund and miscellaneous.....	1,368,946.82	
		15,248,682.59
Leaving balance on hand July 1, 1909.....		5,376,091.52

RECAPITULATION.

Remitted to disbursing officers and paid out on Treasury settlements, etc., from appropriations fiscal year ending June 30, 1909.....	\$36, 310, 634. 62	
And from appropriations of other fiscal years and from indefinite appropriations	15, 248, 682. 59	\$51, 559, 317. 21
Balance in the Treasury, July 1, 1909, of appropriations for the regular service of the Quartermaster's Department for fiscal year ending June 30, 1909...	5, 712, 799. 25	
And of appropriations of other fiscal years and of indefinite appropriations.....	5, 376, 091. 52	11, 088, 890. 77
Grand total for fiscal year ending June 30, 1909.....		62, 648, 207. 98

BUSINESS METHODS.

During the year careful study was given the operation of the business methods designed to decentralize the work of the department, which were explained at length in my annual report for last year. All reports received concerning the operation of the new system were thoroughly considered, and the working of the system was carefully observed in all its details. As a result, it was found to be practicable to broaden the scope of the system and to simplify its operation in several important respects, especially in the direction of lessening the paper work in connection therewith. A revision of Circulars 1 and 11, Office of the Quartermaster-General, 1908, was therefore begun early in the year, and completed and published in Circulars 6 and 7, Office of the Quartermaster-General, 1909, which were promulgated in time to afford all concerned opportunity to acquaint themselves with the new provisions and be enabled to apply them to the transactions of the department for the fiscal year 1910, with which their operation began. In this revision there has been no withdrawal from the position taken in the 1908 circulars, nor has any vital principle therein laid down been abandoned, but there is established greater elasticity of method, increased latitude for the exercise of business judgment and administrative ability on the part of quartermasters, and a further delegation of responsibility for the proper equipment of troops, upkeep of posts and stations, and efficient application of funds apportioned for those purposes.

The results obtained from operations under the revised instructions during the portion of the current year in which they have been in force are gratifying. Sometimes impatience has been evinced with the limitations upon expenditures, a consequence of the apportionments of the department's appropriations, but no better or more efficient method of complying with the laws against creating deficiencies is apparent to this office.

The operations of this department now apply to so large a number of military organizations, posts, and stations, and are conducted over so vast a territory that efficient administration is believed to require responsibility for enforcing the provisions of the act of Congress of February 27, 1906 (Appendix 8, Circular 7, Q. M. G. O., 1909), to be shared by the administrative officers in immediate charge of territorial military divisions or departments, of posts, stations, commands, offices, depots, etc. The effects upon the military service are entirely

ent.

09—Quartermaster

d	d	Overpay- ments.	U
		\$3.57 2.24	
97		2,013.79	
96			
90			
93		2,019.60	
88		180.74 59.50	
91		14.11	
70		3,360.10	
80		50.79	
		1.97	
67			
		350.55 1.75	
82		4,019.51	

continued.

09—Quartermaster's I

d d	Overpay- ments.	Unext bala
35	\$498.62	\$272.
15	20.51	58,
...	...	19,
31	116.56	245,
59	7,402.48	1,022,
74	33.95	28,
...	.10	53,
...	1.41	4,
...
...	1.48	7,
...	...	2,
44	...	4,
...
...	37.92	...
...	11.86	27
...	62.74	37
...
...
28	8,187.63	1,788
...
09	220.69	165
41	91.98	43
...	...	64
75	32.31	60
55	802.35	179
53	54.29	38
...	2.34	...
...	2.00	...
50	...	2
...
83	...	...
88	...	...
...
...
...	10.50	...
90	4.45	...
79	.90	4
23	1,221.81	68
...
...

ntinued.

09—Quartermast

Overpay- ments.	\$9.76
	60.09

[illegible]

continued.

09—Quartermaster

Overpay- ments.	Un- de-
\$9.76	\$
60.09	6
\$2,019.60	\$2
4,019.51	17
8,187.63	1,78
1,221.81	68
60.09	6
15,508.64	2,74

beneficial, through compelling an exercise of judgment and consideration of business matters on the part of responsible officers, and the development of a spirit of self-reliance, which could not exist so long as all proposed expenditures must be first considered and approved in this office.

This department, under direction of the President and Secretary of War, is a federal agent created by Congress for the performance of certain functions and the accomplishment of certain results, as indicated by statutes or as contemplated by the constitutional authority of the President as Commander in Chief of the Army, the whole being governed as to detail by Army Regulations and general orders of the War Department. To vitalize the purposes for which the department exists, Congress, for each fiscal year, places to its credit in the National Treasury, through appropriation acts, a certain portion of the nation's revenue, such as it deems to be necessary and can be spared. As the agent of Congress, under direction of the Secretary of War, it is the duty of this department to expend the funds placed to its credit in such manner as to best effect the purposes for which made, and in accordance with law and regulations. One of the most recent statutes relating to expending appropriations is the act of February 27, 1906, referred to above, which should be read and carefully considered by every officer authorizing, directing, or making expenditures from public funds, as its provisions clearly apply to the officer by whose authority or direction disbursements are made, or whose action necessitates them, if anything more forcibly than to one who merely pays out money to satisfy an indebtedness already incurred. Under this law, no deficiency is legally possible for the purposes not excepted by its terms, without specific written authority of the head of the executive department through which it is incurred. This office takes the view that the statutory mandate against the incurrence of deficiencies, and the penalties for its violation, apply with more force to the officer through whose orders or action a deficiency occurs contrary to the provisions of the law than it does to the officer who makes the apportionments or allotments of appropriations or the disbursements thereunder.

The entire object of the decentralization system is that the functions of the department may be performed and the results it was created to accomplish may be accomplished in accordance with the general statutes defining the same, or with the Army Regulations, based upon the constitutional authority of the President as Commander in Chief of the Army, and that the appropriations made by Congress may be applied to the purposes intended by these constitutional authorities, the general statutes, their own terms, and Army Regulations and War Department orders based thereon, and the amounts appropriated not exceeded, contrary to law. The system is based upon simple and elementary business principles, as was explained on pages 5 and 6 of my annual report for 1908, and when it is studied and its methods applied in conformity with those and the foregoing explanations, it is easily understood and administered and business facilitated, and the application of available funds may be intelligently supervised to meet necessities, with resulting benefit to the service. The advantage to the military service from an intelligent and proper application of the decentralization system is the same as accrues to a commercial concern through a carefully kept

and rigidly scrutinized expense account. Should an emergency necessitate a deficiency, this system provides a means of establishing the nature and extent of it, so that Congress may be fully advised thereto, as required by the act of February 27, 1906. Such complications as have arisen in operating under this system as have been brought to the attention of this office have not generally come about through a sincere effort to apply its methods, but have come from inattention to its principles and the instructions issued, or through efforts to evade the responsibilities it transmits to administrative authorities.

APPROPRIATIONS FOR CONSTRUCTION.

The following table shows the amounts appropriated and available for construction and repair of buildings, water and sewer systems, roads and walks, and incidental purposes, during the fiscal year, the amounts allotted therefrom and purposes for which allotted, and the unallotted balance at the close of the fiscal year. There is also shown the amounts allotted from the general appropriations for use in connection with construction and repair of buildings, heating and lighting systems, etc., and the purposes for which allotted.

Appropriation.	Available July 1, 1908.	Allotted or expended fiscal year 1909.					Unallotted balance June 30, 1908.
		New construction.	Repairs, alterations, etc.	Employees, services, etc.	Supplies, equipment, etc.	Total.	
Barracks and quarters.....	\$3,750,000.00	\$1,910,918.92	\$787,222.53	\$510,479.76	\$405,641.18	\$3,614,260.39	\$135,739.61
Military post exchange.....	400,000.00	\$327,719.29	\$38,077.08	.....	25,000.00	\$386,796.37	14,203.63
Construction and repair of hospitals.....	545,866.00	\$337,668.80	\$206,688.24	.....	.....	\$544,357.04	1,008.96
Quarters for hospital stewards.....	75,000.00	\$57,015.25	\$17,768.21	.....	.....	\$74,783.46	216.54
Shooting galleries and ranges.....	191,850.00	\$27,358.45	161,100.60	.....	.....	\$188,458.93	3,391.07
Military posts.....	911,337.45	754,979.89	26,850.91	5,000.00	.....	786,830.80	124,406.65
Barracks and quarters, seacoast defenses.....	2,456,894.38	2,016,042.87	10,000.00	9,233.39	.....	2,035,276.26	419,668.12
Military prison:							
Fort Leavenworth, Kans.....	210,000.00	101,077.06	.....	.....	.....	101,077.06	108,922.94
San Francisco, Cal.....	135,550.49	33,770.49	.....	.....	.....	33,770.49	196,780.00
Military post:							
Fort Crook, Nebr.....	25,000.00	\$7,632.00	\$638.21	.....	.....	8,270.21	116,729.79
Fort Niagara, N. Y.....	25,000.00	.....	.....	.....	.....	.....	125,271.92
Fort Snelling, Minn.....	25,000.00	.....	413.45	.....	.....	413.45	156,166.25
Army general hospital, Washington, D. C.....	735,971.39	\$22,697.34	.....	8,500.00	.....	31,197.34	104,854.93
Quarters for officers and nurses, Fort Mason, Cal.....	234,775.00	106,576.52	711.92	.....	.....	107,288.44	114,911.93
Water and sewers at military posts.....	\$2,340,775.00	1,124,436.55	131,713.58	742,257.94	297,309.00	2,305,742.27	32,522.73
Roads, walks, wharves, and drainage.....	\$800,000.00	\$46,458.55	156,568.82	28,077.85	18,490.75	209,195.97	728.15
Regular supplies.....	\$1,030,807.13	\$540,280.85	\$144,891.60	.....	4,251.00	1,089,423.45	.....
Incidental expenses.....	\$31,807.34	.....	36,367.08	.....	12,330.28	51,497.34	.....
Army transportation.....	\$5,879.70	.....	.....	.....	5,879.70	5,879.70	.....
Total	13,958,447.02	8,582,125.52	2,122,217.23	1,303,568.94	758,872.59	12,766,784.28	1,191,662.74
Barracks and quarters, Philippine Islands	740,124.26	\$462,083.11	\$162,000.00	\$108,000.00	.....	732,083.11	8,039.15
Grand total	14,698,571.28	9,044,210.63	2,284,217.23	1,411,568.94	758,872.59	13,498,869.39	1,199,701.89

^a Includes \$60,000 apportioned for repair of buildings in Philippines damaged by typhoon.

^b Includes rentals.

^c Includes installation of plumbing, heating, and lighting.

^d Includes amounts apportioned to the Philippine Islands.

^e Includes installation of plumbing and electric wiring.

^f These balances are available in the fiscal year 1910, the appropriations being indefinite as to fiscal years. The other balances are available only for extra work under contracts.

^g For repairs and construction necessary on account of damage by tornado on May 12, 1908; act of May 27, 1908.

^h Apportioned from the general appropriations for the Quartermaster's Department.

ⁱ Appropriation for construction of bakery and laundry buildings.

^j Includes power plants, extension of lighting systems, and installation of new heating and lighting systems in existing buildings.

^k Approximate division of cost, complete figures having been received from the Philippines only for cash payments.

Statement showing buildings constructed or in course of construction in the United States from funds of the fiscal year ended June 30, 1909.

Posts and buildings.	Division of cost.					Total cost for each building.	Total for each post.	Date of completion.
	Building.		Fixtures.					
	Appropriation.	Cost.	Water and sewers, plumbing.	Regular supplies.				
				Heating.	Lighting.			
Alcatraz Island, Cal.: Continuing work on new prison.....	Military prison, Alcatraz Island. M. P. E.	\$33, 770. 49				\$33, 770. 49		
Material for one post exchange each at Alcatraz and Angel Island.		17, 675. 16				17, 675. 16	\$151, 950. 41	
Andrews, Fort, Mass.: 1 coast artillery barrack.....	B. & Q., S. C. D.	32, 238. 00	\$3, 194. 00	\$2, 787. 00		38, 239. 00		(Nov. 16, 1909.
2 double sets noncommissioned officers' quarters.....	do.	13, 670. 00	1, 464. 00	940. 00	\$754. 00	16, 828. 00		Do.
1 guardhouse.....	do.	19, 238. 00	1, 863. 00	1, 177. 00	178. 00	22, 476. 00	107, 063. 00	June 28, 1910.
1 four-set officers' quarters.....	do.	21, 337. 00	2, 280. 00	1, 417. 00	566. 00	25, 670. 00		Do.
Crematory.....	W. & S.	3, 950. 00				3, 950. 00		
Angel Island, Cal. (depot of recruits and casuals): Labor for constructing 2 double noncommissioned officers' quarters (material obtained from buildings destroyed).....	B. & Q.	200. 00	288. 30			488. 30	488. 30	
Baker, Fort, Cal.: 2 double noncommissioned officers' quarters.....	B. & Q., S. C. D.	12, 577. 50	1, 080. 00	400. 00	550. 00	14, 577. 50	14, 577. 50	Completed.
Barrancas, Fort, Fla.: 1 coast artillery barrack.....	do.	23, 500. 00	75. 00	3, 600. 00	800. 00	27, 975. 00		(Jan. 15, 1910.
1 mess hall.....	do.	3, 200. 00	375. 00		375. 00	3, 950. 00		Do.
1 lavatory.....	do.	3, 800. 00	3, 600. 00	800. 00	277. 00	8, 427. 00		
1 double set firemen's quarters.....	do.	5, 375. 00	740. 00		300. 00	6, 324. 00	49, 512. 85	Sept. 15, 1910.
1 shelter for target and tool house.....	S. G. & R.	589. 00				589. 00		
Addition to bath house.....	B. & Q.	247. 85				247. 85		
Barry, Fort, Cal.: Addition to stable.....	B. & Q., S. C. D.	2, 000. 00				2, 000. 00		(Completed.
Gymnasium and bowling alley.....	M. P. E.	9, 920. 00	a 1, 299. 00		a 530. 00	11, 749. 00	14, 369. 00	Do.
1 oil house.....	B. & Q., S. C. D.	620. 00				620. 00		Do.
Bayard, Fort, N. Mex. (U. S. Army General Hospital): 1 medical storeroom.....	C. & R. of H.	7, 435. 00			b 75. 58	7, 510. 58		(Nov. 26, 1909.
1 laundry building and machinery.....	P. & Q.	17, 995. 00	759. 00		96. 19	18, 850. 19		Dec. 26, 1909.
Addition to administration building.....	B. & Q.	4, 080. 00		280. 00	115. 00	4, 475. 00		Dec. 17, 1909.
Addition to post exchange.....	M. P. E.	3, 246. 00		a 260. 00	a 108. 00	3, 714. 00	143, 926. 02	Jan. 24, 1910.
Quarters for Army Nurse Corps.....	Special.	23, 600. 00	a 4, 168. 00	2, 540. 00	a 1, 639. 31	31, 947. 00		Dec. 26, 1909.
3 double sets captains' quarters.....	do.	64, 200. 00	a 6, 216. 00	a 4, 587. 00	a 2, 426. 25	77, 429. 25		Do.

Statement showing buildings constructed or in course of construction in the United States from funds of the fiscal year ended June 30, 1909—Continued.

Posts and buildings.	Division of cost.					Total cost for each building.	Total for each post.	Date of completion.
	Building.		Fixtures.					
	Appropriation.	Cost.	Water and sewers, plumbing.	Regular supplies.				
				Heating.	Lighting.			
D. A. Russell, Fort, Wyo.:	M. P.	\$38,898.00	\$11,214.70	\$7,654.02	\$2,926.28	\$120,693.00		July 30, 1910.
2 double cavalry barracks	do.	22,600.00	1,276.21	1,331.97	1,103.48	26,311.66		Mar. 31, 1910.
1 commanding officer's quarters	C. & R. of H.	52,432.00	a 6,797.00	2,300.00	b 5,633.00	67,162.00		Oct. 28, 1909.
1 hospital building	B. & Q.	7,949.00	826.00	1,233.00	510.00	10,518.00		Oct. 15, 1909.
2 dispensaries for artillery and cavalry posts	do.	18,890.00	513.00		145.00	19,548.00		Nov. 15, 1909.
1 signal corps stable	do.	37,107.00	3,490.75	2,802.60	1,536.64	44,936.99		July 30, 1910.
2 double set bachelor officer's quarters	do.	41,970.00	2,054.79	2,837.91	1,678.74	48,541.44		Do.
2 field officer's quarters	do.	12,650.00	1,187.90	1,092.48	1,744.80	15,675.18		Do.
2 double sets noncommissioned staff officer's quarters	do.	59,930.00	3,882.72	3,853.92	2,587.20	70,253.84		Mar. 31, 1910.
8 double sets lieutenant's quarters	do.	57,704.00	1,671.16		764.40	60,139.56		Oct. 10, 1910.
4 cavalry stables	do.	11,181.00	409.48		176.40	11,766.88		Do.
1 band stable	do.	18,669.00	1,665.60	1,683.25	329.26	22,347.11	\$841,581.94	May 30, 1910.
1 guardhouse	do.	154,714.00	8,149.19	9,264.15	6,839.42	178,966.76		July 31, 1910.
7 double sets captain's quarters	do.	9,242.00				9,242.00		Do.
2 quartermaster's workshops	do.	25,870.00	489.80	1,796.70		25,870.00		Mar. 31, 1910.
2 granaries	do.	23,965.00	169.70		215.60	26,196.10		Do.
2 substistence storehouses	do.	6,100.00	198.70		119.56	6,389.26		May 30, 1910.
2 fire stations	do.	3,975.00				3,975.00		Apr. 30, 1910.
Hay shelter	do.	8,772.00				8,772.00		May 30, 1910.
2 coal sheds	do.	27,340.00			237.16	27,577.16		July 31, 1910.
2 quartermaster's storehouses	do.	36,700.00				36,700.00		
2 post exchanges (1 for cavalry and 1 for infantry post), plumbing, etc., from funds fiscal year 1910.	M. P. E.							
Douglas, Fort, Utah:								
2 double barracks (plumbing from funds of fiscal year 1910).	M. P.	111,440.00		9,542.00	2,136.00	123,118.00		Dec. 1, 1910.
1 band barrack	B. & Q.	15,875.00		1,476.00	338.00	17,709.00	152,407.00	June 30, 1910.
1 ordnance storehouse	do.	2,490.00				2,490.00		Dec. 1, 1910.
1 bowling alley	M. P. E.	4,750.00				4,750.00		Mar. 7, 1910.
Crematory	W. & S.	4,350.00				4,350.00		
Dupont, Fort, Del.:								
1 double barrack, coast artillery	B. & Q., S. C. D.	50,912.90	7,296.00	4,380.00		62,588.90		Nearly completed.
1 band barrack	do.	13,951.00	1,620.00	1,280.00		16,851.00		Do.
1 double set firemen's quarters	do.	4,990.00	668.00			5,658.00		Do.
Electric wiring for above buildings	do.				1,417.75	1,417.75		Completed.
1 double set noncommissioned officer's quarters	B. & Q., S. C. D.	6,075.00	620.00	380.00		7,401.00	93,886.65	

Statement showing buildings constructed or in course of construction in the United States from funds of the fiscal year ended June 30, 1909—Continued.

Posts and buildings.	Division of cost.					Total cost for each building.	Total for each post.	Date of completion.
	Building.		Fixtures.					
	Appropriation.	Cost.	Water and sewers, plumbing.	Regular supplies.				
				Heating.	Lighting.			
Leavenworth, Fort, Kans.: Addition to field officers' quarters, No. 3. Storehouse for officers' property. 1 double signal corps barracks. 1 wireless telegraph station. 1 double stable guard building. 1 signal corps stable. 1 gun shed. 1 cavalry drill hall (erected prior to this fiscal year). 1 double hospital corps sergeants' quarters. 1 band stand. Approaches to Grant, Sherman, and Sheridan halls. Remodeling 4 sets officers' quarters, No. 19. 1 additional laundry building. Leavenworth, Fort, Military Prison: Machinery, material, and labor for rebuilding prison.	B. & Q. do. M. P. B. & Q. do. do. do. H. S. qrs. B. & Q. do. do. R. S.	\$590.00 9,739.00 58,561.00 2,039.00 4,485.00 18,975.00 9,543.00 8,979.00 2,600.00 16,757.50 8,798.00 850.00	\$653.00 6,543.00 126.00 722.00 a 681.00 699.00	\$87.50 4,834.00 1,927.00 116.00 228.00 258.00 2,846.00 b 496.00 1,400.00 965.00	\$57.25 1,927.00 116.00 228.00 258.00 2,846.00 b 496.00 965.00	\$1,387.75 9,739.00 71,865.00 2,281.00 4,713.00 19,955.00 9,543.00 2,846.00 10,156.00 2,600.00 16,757.50 11,892.00 850.00	Completed. Do. Aug. 17, 1910. June 19, 1910. Do. Do. June 9, 1910. Completed. Dec. 31, 1909. Completed. June 27, 1910. Completed.	
Temporary laundry building. Stable. Lisicum, Fort, Alaska: 1 hospital corps sergeant's quarters. Converting stable into civilians' quarters. Logan H. Roots, Fort, Ark.: Temporary stable. Shooting gallery. Logan, Fort, Colo.: Addition to hospital. MacKenzie, Fort, Wyo.: Gallery practice building and range house. Bowling alley.	Military prison Fort Leavenworth, Kans. B. & Q. do. H. S. qrs. B. & Q. do. S. G. & R. C. & R. of H. S. G. & R. M. P. E.	101,077.06 3,500.00 13,277.07 2,000.00 308.41 250.00 261.75 7,924.00 1,750.00 6,041.38	758.00 177.20 a 889.00	250.00 1,137.00 b 134.00	250.00 485.61 2,000.00 250.00 261.75 10,084.00 1,750.00 6,041.38	118,862.13 2,465.61 511.75 10,084.00 7,791.38	Do. Do. Do. Do. Do.	

Madison Barracks, N. Y.:	B. & Q.	790.34	938.35	446.00	11,673.69	18,452.69	Oct. 10, 1909.
1 field officers' quarters	do.	451.00	408.00	253.00	6,779.00	Do.	Do.
1 double set, noncommissioned officers' quarters					622,687.34		
Mason, Fort, Cal.:	Army supply depot Fort Mason, Cal.	622,687.34				624,237.34	Mar. 31, 1911.
Sea wall, crib wall, 3 transport wharves, and 1 shed, etc. (charged to funds fiscal year 1909).						2,497.00	
	S. G. & R.	1,550.00			1,550.00	1,287.00	Completed.
Shooting gallery	B. & Q.	1,497.00			2,497.00	Do.	Do.
McDowell, Fort, Cal.: Latrine buildings	S. G. & R.	584.00	845.00		1,429.00		Completed.
McIntosh, Fort, Tex.: Shooting gallery	B. & Q.				1,333.00		Do.
McKinley, Fort, Me.:	S. G. & R.				1,622.30		Do.
Bowling alley (erected in preceding fiscal year)	B. & Q.				8,565.90	137,232.25	July 7, 1910.
Wood shed	S. G. & R.	571.90	56.00	379.00	2,238.20		Do.
Shooting gallery	B. & Q.	2,105.20	1,039.00	997.00	89,286.75		Do.
1 double set, noncommissioned officers' quarters	do.	8,744.75	4,742.00	1,930.00	7,757.10		Do.
4 sets bachelor officers' quarters	do.	606.10		302.00	12,302.00		Sept. 30, 1910.
1 double coast artillery barrack	do.	900.00	875.00	350.00	1,975.00		Dec. 29, 1909.
1 double set, firemen's quarters	do.						Completed.
McPherson, Fort, Ga.: 1 company officers' quarters	B. & Q.						Do.
McRee, Fort, Fla.: Coal shed	do.						Do.
Meade, Fort, S. Dak.:	do.						Do.
3 cavalry stables	do.	48,945.00		809.50	51,985.50		Jan. 2, 1910.
1 quartermaster storehouse	do.	17,800.00		218.00	19,518.00		Do.
1 hay shed	do.	4,612.00	835.00		4,612.00	76,422.77	Completed.
1 target house	do.	307.27			307.27	Do.	Do.
Miley, Fort, Cal.: Shooting gallery	S. G. & R.	1,500.00			1,500.00		Do.
Missoula, Fort, Mont.:	do.						Do.
1 four-set officers' quarters	B. & Q.	26,100.00	1,983.00	910.00	30,453.00		June 1, 1910.
1 single set, field officers' quarters	do.	12,550.00	1,215.00	381.00	15,596.00		Do.
4 single sets company officers' quarters	do.	38,000.00	4,760.00	1,280.00	47,516.00	185,663.00	Do.
1 double set company officers' quarters	do.	18,500.00	1,850.00	645.00	22,581.00		Do.
1 double barrack, infantry, for 170 men	M. P.	56,000.00	6,450.00	1,245.00	69,517.00		Do.
Monroe, Fort, Va.:							
2 single sets field officers' quarters	B. & Q.	21,770.00	1,830.00	975.00	25,885.00		Oct. 1, 1909.
1 addition to post exchange	M. P.	3,208.00	397.00	138.00	3,723.00		Completed.
1 set quarters for engineer officer	B. & Q.	6,740.00	301.50	283.25	7,324.75		Dec. 10, 1909.
Engineer office	do.	2,470.00	179.00		2,649.00		Do.
Library building, including book stacks	do.	49,900.00	850.00	1,600.00	53,950.00		Completed.
1 double barrack, coast artillery	do.	46,500.00	6,350.00	1,200.00	59,250.00		Do.
1 double set noncommissioned officers' quarters	do.	5,430.00	585.00	298.00	6,710.00		Do.
2 double firemen's quarters	do.	8,098.00	1,060.00	397.00	9,496.00		Oct. 9, 1909.
Completing officers' school building	do.	5,433.00		348.00	6,878.00		Completed.
Completing officers' quarters, Nos. 16, 17, and 18	do.	9,590.00	1,445.00		9,590.00	184,680.75	Do.

^a Chargeable to same appropriation as construction proper.

^b Writing only chargeable to same appropriation as construction proper.

^c Expenditures authorized for roads, walks, and grading in connection with this work pertain to the reservation branch.

^d In lieu of amount set forth in annual report fiscal year 1911. Total amount of contract \$1,127,230, of which only \$600,000 charged to funds fiscal year 1909. Add \$20,000 for storehouse foundations and \$2,687.34 for extras, etc.

Statement showing buildings constructed or in course of construction in the United States from funds of the fiscal year ended June 30, 1909—Continued.

Posts and buildings.	Division of cost.					Total cost for each building.	Total for each post.	Date of completion.
	Building.		Fixtures.					
	Appropriation.	Cost.	Water and sewers, plumbing.	Regular supplies.				
				Heating.	Lighting.			
Morgan, Fort, Ala: 1 single barracks, coast artillery..... 1 set field officers' quarters..... 4 single sets company officers' quarters..... Mess hall..... Lavatory..... 1 double set firemen's quarters..... 1 wagon shed..... Moving administration building and 2 sets noncom- missioned officers' quarters..... Moultrie, Fort, S. C.: Target shelter, etc..... Band barracks..... 4 single sets noncommissioned officers' quarters..... Lavatory for band..... Myer, Fort, Va.: Balloon shed..... Corral fence..... 1 field staff, and band stable..... 1 veterinary stable..... Niagara, Fort, N. Y.: Addition to temporary stable..... Lavatory building on target range, including plumb- ing..... 1 ice house..... Omaha, Fort, Nebr.: Addition to temporary stable..... Ogethorpe, Fort, Ga.: Fencing target range at Catoosa Springs..... Storehouse for grain at Catoosa Springs..... Shooting gallery..... 1 field officers' quarters..... 1 double set lieutenants' quarters..... Philadelphia depot, Pa.: Concrete storehouse.....	B. & Q., S. C. D. do. do. do. do. do. do. do. do. S. G. & R. B. & Q., S. C. D. do. do. do. B. & Q. do. 							

Pikeons, Fort, Fla.: Material for temporary building for troops in camp.....	B. & Q.....	1,481.00	789.00	.....	.....	1,481.00	8,472.00	{Completed.
1 double set firemen's quarters.....	B. & Q., S. C. D.....	5,385.00	.....	817.00	.....	6,991.00	.....	{Do.
Porter, Fort, N. Y.: Addition to quartermaster stables.....	B. & Q.....	1,726.81	.....	.....	.....	1,726.81	2,030.81	{Do.
Handball court.....	M. P. E.....	304.00	.....	.....	.....	304.00	.....	{Do.
Presidio of San Francisco, Cal.: 1 double barrack (170 men).....	M. P.....	51,300.00	6,180.00	4,055.00	862.00	62,397.00	.....	{Dec. 16, 1909.
1 double barrack.....	B. & Q.....	14,198.00	1,748.00	1,325.00	232.00	17,503.00	.....	{Do.
3 double sets noncommissioned officers' quarters.....	do.	15,150.00	1,839.00	.....	429.00	17,418.00	.....	{Do.
3 addition to stable at department headquarters.....	do.	313.61	.....	.....	.....	313.61	283,755.61	{Do.
3 field officers' quarters.....	do.	30,690.00	2,367.00	1,900.00	840.00	35,706.00	.....	{Feb. 28, 1910.
7 single company officers' quarters.....	do.	55,377.00	5,026.00	3,500.00	1,610.00	65,513.00	.....	{Do.
5 double sets company officers' quarters.....	do.	71,685.00	6,385.00	4,750.00	2,075.00	84,905.00	.....	{Do.
Presidio of San Francisco (infantry cantonment): Tents, kitchens, dining rooms, and latrines.....	do.	8,700.00	3,400.00	.....	.....	12,100.00	13,500.00	{Completed.
Temporary stable for Signal Corps.....	do.	1,400.00	.....	.....	.....	1,400.00	.....	{Do.
Presidio of San Francisco, General Hospital: Insane ward.....	C. & R. of H.....	13,399.00	.....	940.00	.....	15,659.00	15,659.00	{Do.
Presidio of Monterey, Cal.: Range house.....	S. G. & R.....	1,200.00	.....	.....	.....	1,200.00	1,200.00	{Do.
Reno, Fort, Okla., remount depot: 2 stables.....	B. & Q.....	8,400.00	.....	.....	.....	8,400.00	13,071.00	{Do.
2 hay sheds and veterinary hospital.....	do.	4,671.00	.....	.....	.....	4,671.00	.....	{Do.
Riley, Fort, Kans.: 2 hay sheds.....	do.	6,075.00	.....	.....	.....	6,075.00	.....	{Do.
Corral fence and gates for mounted service schools.....	do.	3,307.50	.....	.....	.....	3,307.50	.....	{Do.
2 gun sheds.....	do.	22,000.00	.....	.....	.....	22,000.00	.....	{Nov. 4, 1909.
Isolation hospital.....	C. & R. of H.....	14,000.00	.....	.....	.....	18,629.00	116,036.50	{Do.
Wireless-telegraph station.....	B. & Q.....	2,274.00	.....	2,233.00	.....	2,274.00	.....	{Completed.
Post exchange and gymnasium.....	M. P. E.....	29,700.00	.....	.....	.....	34,665.00	.....	{June 28, 1910.
1 four-set officers' quarters.....	B. & Q.....	24,293.00	.....	.....	.....	29,086.00	.....	{Feb. 28, 1910.
Robinson, Fort, Nebr.: Addition to hospital.....	C. & R. of H.....	23,800.00	.....	.....	.....	27,479.00	27,479.00	{Jan. 15, 1909.
Rosecrans, Fort, Cal.: Shooting gallery.....	S. G. & R.....	502.69	.....	.....	.....	502.69	.....	{Completed.
2 double sets noncommissioned officers' quarters.....	B. & Q., S. C. D.....	12,940.00	1,318.00	620.00	.....	14,878.00	15,380.69	{Do.
San Houston, Fort, Tex.: Storehouse at Leon Springs target range.....	S. G. & R.....	2,379.99	.....	.....	.....	2,379.99	.....	{Do.
Target range.....	do.	1,377.99	.....	.....	.....	1,377.99	.....	{Do.
Paddock fences and picket lines.....	B. & Q.....	6,191.00	.....	.....	.....	6,191.00	61,720.19	{Nov. 13, 1909.
Addition to hospital.....	C. & R. of H.....	42,516.00	.....	.....	.....	48,357.20	.....	{Do.
Elevator in hospital.....	do.	3,415.00	.....	.....	.....	3,415.00	.....	{Do.
Schofield Barracks, Hawaii: Material and labor for construction of cantonment.....	B. & Q.....	83,651.54	.....	.....	.....	83,651.54	86,711.54	{Feb. 24, 1910.
Water and sewer connections for same.....	do.	.....	3,060.00	.....	.....	3,060.00	.....	{Do.
Screven, Fort, Ga.: 1 coast artillery barrack.....	B. & Q., S. C. D.....	19,575.00	.....	2,208.00	462.00	22,245.00	.....	{Do.
1 five-set bachelor officers' quarters.....	do.	17,595.00	.....	1,060.00	.....	19,234.00	.....	{Do.
2 single noncommissioned officers' quarters.....	do.	6,792.00	.....	.....	.....	6,988.00	66,256.20	{Do.
Lavatory.....	do.	4,235.00	.....	.....	.....	5,506.00	.....	{Do.
Bowling alley.....	M. P. E.....	6,343.20	.....	.....	.....	6,343.20	.....	{Nov. 15, 1909.
Mess hall.....	B. & Q., S. C. D.....	5,940.00	.....	.....	.....	5,940.00	.....	{Feb. 24, 1910.

^a Chargeable to same appropriation as construction proper.

^b Writing only, chargeable to same appropriation as construction proper.

Statement showing buildings constructed or in course of construction in the United States from funds of the fiscal year ended June 30, 1909—Continued.

Posts and buildings.	Division of cost.					Total cost for each building.	Total for each post.	Date of completion.
	Building.		Fixtures.					
	Appropriation.	Cost.	Water and sewers, plumbing.	Regular supplies.				
				Heating.	Lighting.			
Shafter, Fort, Hawaii:	M. P.	\$43,894.96	\$1,983.00			\$942.00	\$44,836.96	{Completed. Do. Do. Do. Do. Do. Do. Do. Do. Do.
2 barracks for 65 men each.....	B. & Q.	17,109.00	752.00			528.00		
1 four-set bachelor officers' quarters.....	do.	15,826.00	1,032.00			422.00		
1 double mess hall and kitchen.....	do.	12,133.00	1,032.00			490.00		
1 field officers' quarters.....	do.	11,168.00	1,276.00			370.00		
2 noncommissioned staff officers' quarters.....	do.	7,959.00	8,322.00			350.00		
2 lavatories for barracks.....	do.	2,458.00						
Coal shed.....	do.	2,458.00						
Addition to post hospital.....	C. & R. of H.	5,090.00	a 427.00			b 160.00		
Swimming pool.....	M. P. E.	3,864.00						
Sheridan, Fort, Ill.:	C. & R. of H.	7,350.00	a 587.00	\$550.00		b 376.00	80,285.00	{Do. Do. Do.
Addition to post hospital.....	B. & Q.	13,700.00	24,944.00	16,738.00		1,250.00		
Remodeling wings of barracks.....	do.	13,930.00	860.00					
Quartermaster's stable.....	do.						1,800.00	{Do. Do. Do. Do. Do. Do. Do. Do. Do. Do.
Sill, Fort, Okla.:	do.	1,800.00						
Temporary quarters for civilians.....	do.							
Band stand.....	do.	884.25						
Blacksmith shop.....	do.	228.84						
Temporary quarters for pack-train employees.....	do.	810.51	56.25					
Post exchange and gymnasium.....	M. P. E.	18,850.00	a 1,433.28	a 1,300.00		a 580.00		
2 field artillery barracks.....	M. P.	54,000.00	5,796.14	2,600.00		1,026.67		
Band barnyard.....	B. & Q.	14,200.00	1,327.67	940.00		6,847.67		
Administration building.....	do.	4,900.00	1,220.47	750.00		315.00		
4 double sets noncommissioned officers' quarters.....	do.	15,600.00	1,990.64	2,040.00		575.00		
Quartermaster's stable.....	do.	19,600.00	430.88			20,205.64		
Band stable.....	do.	10,250.00	379.41			20,200.88		
6 battery stables.....	do.	117,600.00	2,585.78			10,789.41		
1 field officers' quarters.....	do.	12,300.00	908.31			160.00		
6 double sets officers' quarters.....	do.	80,350.00	6,410.70	700.00		660.00		
Concrete conduits for above buildings.....	do.			5,160.00		120,845.78		
Working in 1 double officers' quarters.....	do.			29,957.62		14,138.31		
Conduits for same.....	do.			325.72		91,920.70		
				219.99		30,503.33		
							420,943.13	Dec. 28, 1910.

Location and Description	C. & R. of H.	33,771.00	a 3,874.00	6,933.00	b 1,508.00	46,086.00	Completed. Do.
Slocum, Fort, N. Y.: Addition to post hospital.	do.	17,671.00	2,160.00	1,661.00	b 475.00	22,140.00	Dec. 1, 1909.
1 four-set officers' quarters.	B. & Q.	22,989.00	2,140.00	1,697.36	1,536.00	28,162.36	Do.
2 double sets noncommissioned officers' quarters.	do.	13,288.00	1,490.00	1,600.00	1,498.00	15,886.00	Do.
1 double set lieutenants' quarters.	do.	18,040.00	1,659.00	1,213.24	1,073.00	21,985.24	Do.
1 double set hospital sergeants' quarters.	H. S. qrs.	10,398.00	a 663.00	300.00	b 430.00	11,791.00	Do.
Additions and alterations to post exchange.	M. P. E.	12,314.00	a 777.00	a 1,057.50	a 464.00	14,612.50	Feb. 8, 1910.
Crematory.	W. & S.	3,901.00				3,901.00	
Shelling, Fort, Minn.: Addition to post hospital.	C. & R. of H.	9,950.00	a 2,850.00	1,404.00	b 682.00	14,886.00	Completed. Do.
Quartermasters' stable.	B. & Q.	13,850.50	500.00		150.00	14,500.50	Do.
Conversion of bakery into waiting room.	do.	210.00	250.00		58.50	518.50	Do.
Ice house.	do.	5,025.00				5,025.00	Do.
Stevens, Fort, Oreg.: Gymnasium and bowling alley.	M. P. E.	9,159.20	a 1,356.90	a 1,214.70	a 919.95	12,650.65	Oct. 31, 1909.
4 double sets noncommissioned officers' quarters.	B. & Q., S. C. D.	21,066.55	3,110.40	1,735.30	1,983.50	27,900.75	Do.
1 double set firemen's quarters.	do.	4,874.25	732.80		441.55	6,048.60	Do.
Signal corps storehouse.	do.	3,687.00				3,687.00	Completed. Do.
Fire station.	do.	2,080.00			75.00	2,155.00	Do.
Strong, Fort, Mass.: 1 double, coast artillery, barrack.	do.	55,250.00	6,000.00	3,729.00	1,632.00	66,631.00	July 30, 1910.
1 double noncommissioned officers' quarters.	do.	5,759.00	598.00	480.00	280.00	7,117.00	Do.
1 double set firemen's quarters.	do.	4,678.00	850.00		237.00	5,765.00	Do.
1 four-set officers' quarters.	do.	23,800.00	2,793.00	1,394.00	1,068.00	29,075.00	Do.
St. Michael, Fort, Alaska: Labor for construction of noncommissioned officers' quarters.	B. & Q.	1,450.00				1,450.00	
Labor for construction of stable.	do.	425.00				425.00	
Dog kennels, storehouses, etc.	do.	1,000.00				1,000.00	
Material for new gymnasium and bowling alley.	do.	6,000.00				6,000.00	
St. Philip, Fort, La.: Temporary building for camp.	M. P. E.	1,881.48	741.84			2,623.32	Completed.
Standish, Fort, Mass.: 1 noncommissioned officers' quarters.	B. & Q., S. C. D.	4,494.00	412.00	240.00	153.00	5,289.00	
Terry, Fort, N. Y.: 1 double, coast artillery, barrack.	do.	72,172.00	6,858.72	4,810.00	1,014.00	84,854.72	Sept. 30, 1910.
1 single, coast artillery, barrack.	do.	40,462.00	3,529.35	3,360.00	568.00	47,944.35	Do.
1 four-set bachelor officers' quarters.	do.	23,095.00	1,530.54	1,309.00	671.00	26,605.54	Do.
4 company officers' quarters.	do.	23,095.00	1,530.54	1,300.00	1,071.00	27,996.54	Do.
2 field officers' quarters.	do.	23,996.00	2,085.64	1,532.00	520.00	28,103.64	Do.
3 double sets noncommissioned officers' quarters.	do.	23,640.00	2,256.06	1,020.00	462.00	27,378.06	Do.
1 double set firemen's quarters.	do.	5,843.00	671.52		126.00	6,640.52	Do.
1 post-exchange building.	M. P. E.	15,500.00	a 763.00	a 917.00	a 265.00	17,285.00	Dec. 27, 1909.
Purchase of Rizzuto cottage.	B. & Q.	500.00				500.00	
Totten, Fort, N. Y.: 1 coast artillery barrack.	B. & Q., S. C. D.	26,238.00	3,025.00	2,189.00	670.00	32,172.00	July 30, 1910.
1 band barrack.	do.	12,689.00	1,451.00	1,276.00	423.00	15,839.00	Do.
Crematory.	W. & S.	3,800.00				3,800.00	
Taylor, Fort, Fla.: Temporary guardhouse.	B. & Q., S. C. D.	868.00				868.00	

^a Wiring only chargeable to same appropriation as construction proper.

^b Chargeable to same appropriation as construction proper.

Statement showing buildings constructed or in course of construction in the United States from funds of the fiscal year ended June 30, 1909—Continued.

Posts and buildings.	Division of cost.					Total cost for each building.	Total for each post.	Date of completion.
	Building.		Fixtures.					
	Appropriation.	Cost.	Water and sewers, plumbing.	Regular supplies.				
				Heating.	Lighting.			
Vancouver Barracks, Wash.: 1 quartermasters' stable. Tennis court. Wadsworth, Fort, N. Y.: Gymnasium and bowling alley. Walter Reed Army General Hospital: 1 double set hospital sergeants' quarters. 2 single sets officers' quarters. Hospital corps barrack. Storehouse. Wagon shed and garage. Passenger and service elevators in main building. Stable. Ward, Fort, Wash.: 2 double sets lieutenant's quarters. 3 double sets noncommissioned officers' quarters. 1 firemen's quarters. 1 single, coast artillery, barrack. 1 post exchange and gymnasium. 1 bakery. Washington Barracks, D. C.: Corral fence. Washington, Fort, Md.: 1 double set noncommissioned officers' quarters 1 single set noncommissioned officers' quarters. 1 double set firemen's quarters Whipple Barracks, Ariz.: Shooting gallery Williams, Fort, Me.: 1 double set firemen's quarters 2 double sets noncommissioned officers' quarters. 1 five-set bachelor officers' quarters. Band stand 1 Coast Artillery barrack. Addition to hospital.	B. & Q. M. P. E. do. H. S. qrs. B. & Q. M. P. B. & Q. do. C. & R., H. B. & Q. B. & Q., S. C. D. do. do. M. P. E. R. S. B. & Q. B. & Q., S. C. D. do. do. S. G. & R. B. & Q., S. C. D. do. do. do. do. C. & R. of H.	\$16,880.00 528.25 30,108.12 10,287.00 21,284.00 60,392.00 15,147.00 4,475.00 7,175.00 6,824.00 29,480.00 17,535.00 4,835.00 27,910.00 13,480.00 6,550.00 6,417.00 6,605.00 4,670.00 4,972.00 1,800.00 6,785.00 15,638.00 21,925.00 1,098.00 28,591.00 5,216.00	\$935.00 a 846.00 2,370.00 6,000.00 479.00 100.00 385.00 2,900.00 2,664.00 841.00 3,477.00 a 1,266.00 765.00 620.00 355.00 585.00 638.00 1,266.50 2,225.50 3,644.00		\$216.00 b 843.00 1,027.00 341.00 53.00 78.00 720.00 714.00 152.00 729.00 a 333.00 106.00 375.00 150.00 240.00 302.00 758.00 997.00 2,339.00 762.00	\$18,631.00 528.25 30,108.12 11,489.00 25,674.00 71,850.00 16,896.00 4,628.00 7,175.00 7,287.00 36,000.00 21,957.00 5,828.00 36,152.00 16,553.00 8,098.00 417.00 7,950.00 5,328.00 5,797.00 1,800.00 7,725.00 18,362.50 26,186.50 1,098.00 35,403.00 6,098.00	\$19,159.25 30,108.12 145,008.00 417.00 19,075.00 1,800.00 94,873.00	Completed. Jan. 29, 1910. {Completed. Jan. 4, 1910. Do.<

	B. & Q., S. C. D.	65,554.00	6,312.00	6,069.00	830.00	78,762.00	Mar. 28, 1910.
Winfield Scott, Fort, Cal.:							
2 single, Coast Artillery, barracks	do	22,827.00	1,996.00	1,325.00	492.00	27,640.00	Dec. 28, 1909.
1 four-set officers' quarters	do	19,356.00	2,318.20	.....	620.00	22,294.20	Mar. 28, 1910.
4 double sets noncommissioned officers' quarters	do	14,337.00	1,279.00	950.00	415.00	16,981.00	Feb. 28, 1910.
Wingate, Fort, N. Mex.:							
1 double set officers' quarters	do	24,700.00	.....	.....	.....	28,853.00	
Post exchange and gymnasium	M. P. E.	224.00	.....	.....	.....	376.00	
Addition to civilian employees' quarters	B. & Q.	.....	.....	.....	.....	29,229.00	
Warden, Fort, Wash.:							
Removing and rebuilding administration building	do	2,850.00	550.00	950.00	105.00	4,455.00	Completed.
2 double sets noncommissioned officers' quarters	do	9,272.00	1,349.00	778.00	730.00	12,130.00	Do.
1 double set firemen's quarters	B. & Q., S. C. D.	4,365.00	649.00	.....	265.00	5,279.00	
Extra work on new barracks	do	1,066.80	.....	.....	.....	1,066.80	
Wm. H. Seward, Fort, Alaska: Addition to quartermasters' stable	B. & Q.	2,500.00	.....	.....	.....	2,500.00	
Wm. H. Harrison, Fort, Mont.:							
Bowling alley	M. P. E.	6,800.00	.....	.....	.....	7,151.00	Nov. 12, 1909.
Ordinance storehouse	B. & Q.	3,973.00	.....	.....	.....	3,973.00	Oct. 9, 1909.
Range house	S. G. & R.	672.00	.....	.....	.....	672.00	
Yellowstone, Fort, W. Yo.:							
Completing construction of stables	B. & Q.	288,801.76	1,500.00	.....	370.00	38,671.76	Completed.
Completing construction of barracks	M. P.	51,400.93	.....	.....	.....	51,400.93	Do.
Quarrying stone for new officers' quarters and stables	B. & Q.	14,500.00	.....	.....	.....	14,500.00	
Temporary building for employees	do	1,300.00	.....	.....	.....	1,300.00	
Additions to Barracks Nos. 5 and 28	do	8,368.73	3,833.94	.....	769.70	13,073.37	Do.
Enlarging two storehouses	do	4,500.00	.....	.....	.....	4,500.00	
Picket lines for new stables	do	2,847.36	.....	.....	.....	2,847.36	
Corral fences	do	7,309.44	.....	135.00	.....	7,444.44	
Alaska in general: Cabins for enlisted men Signal Corps, and additions to same.	B. & Q.	.....	.....	.....	.....	7,444.44	
Total		6,314,779.00	451,152.40	321,716.51	143,224.60	7,230,872.51	7,230,872.51

^a Chargeable to same appropriation as construction proper.

^b Writing only chargeable to same appropriation as construction proper.

^c In addition to \$18,724 in fiscal year 1908; total cost from B. & Q. \$55,525.76.

^d In addition to \$34,197 allowed in previous fiscal year; total \$51,400.93.

^e In addition to \$500 allowed in previous fiscal year; total, \$15,000.

COST OF CONSTRUCTION.

In pursuance of the policy outlined in the last annual report, and in accordance with the desires of the Secretary of War, this office has been constantly endeavoring to reduce the cost of construction for barracks and quarters to the lowest possible point, consistent with good construction and reasonable accommodation. Much has been accomplished in this direction, and buildings have been designed and constructed, in various parts of the United States, costing approximately as follows, it being understood that the price varies with different localities, viz, field artillery barracks, to accommodate 100 men, constructed of reinforced concrete, \$32,000; barrack for coast artillery, 109 men, reinforced concrete, \$35,000; double coast artillery barracks, to accommodate 218 men, brick, \$63,000; single field officer's quarters, either brick or reinforced concrete, with slate or tile roof, \$12,000; single captain's quarters, concrete or brick, \$9,000; double captains' quarters, brick, \$16,000; double lieutenants' quarters, three bedrooms, brick or concrete, \$15,000; building for four officers, including parlor, dining room, small library, kitchen, servant's room, two bedrooms and a bath, with storage space, and pantry, at a cost of \$28,000, or \$7,000 per set of quarters.

These prices show a reduction from prices formerly prevailing of about 16 per cent in cost of officers' quarters, 26 in barracks, 10 in storehouses, and 5 in stables, and it is believed the accommodations provided are entirely suitable. It is hoped, however, that the plans may be still further perfected and improved toward decreasing the cost of construction. Efforts are now being made in that direction, but are hampered because of pressure of current business and the want of enough properly qualified officers to give the matter the careful, personal attention necessary to develop and perfect the plans.

ARRANGEMENT OF BUILDINGS AT MILITARY POSTS.

The policy usually followed heretofore in laying out a military post has been to allow long distance between buildings, with the result that a regimental post generally covers a considerable area, and necessitates large expenditures for construction of the necessary roads, walks, sewer and water systems, electric lighting, etc., and subsequently entails great expense in the care and maintenance of the grounds. The result of this is a post, expensive both in original construction and in upkeep, and generally in the maintenance of a park for the use of the local public. If the appropriations were unlimited this would undoubtedly be desirable. It is not, however, considered that the appropriations for the support of the army should be spent for such a purpose, and this office believes that military posts, and particularly the coast artillery posts, should be more consolidated. It is hoped to put a policy of concentration into practice at posts where new construction is contemplated. This would particularly apply to the new cavalry post in the Hawaiian Islands, and also to the recruit depot on Angel Island, California, plans for both of which are now being considered in this office.

SUPPLIES.

Forage.—There were purchased during the fiscal year 305,175,385 pounds of forage (including bedding) at a cost of \$3,379,068.25.

Fuel and mineral oil.—Purchases of fuel of all kinds, except for transports and other vessels, aggregated during the fiscal year \$2,180,483.57. Purchases of fuel for transports and other vessels aggregated \$746,032.17. Purchases of mineral oil for lighting aggregated \$215,865.63.

ANIMALS AND MEANS OF TRANSPORTATION.

Following is a statement of purchases, remounts, draft and pack animals, vehicles, and articles pertaining to transportation, viz:

	Number.	Total cost.	Average.
Cavalry horses.....	1,832	\$293,244.70	\$160.057
Artillery horses.....	618	118,122.70	191.12
Riding horses.....	222	32,336.00	145.658
Small horses.....	433	41,807.18	96.552
Young horses (for remounts).....	676	98,886.48	146.28
Bell horses.....	1	160.00	160.00
Draft horses.....	147	33,171.10	225.65
Draft mules.....	1,068	195,143.50	182.72
Pack mules.....	452	71,787.25	158.82
Dogs.....	77	3,440.00	44.675
Automobiles.....	4	12,665.75	3,166.44
Escort wagons.....	300	27,930.00	93.10
Farm wagons.....	2	62.20	31.10
Spring wagons:			
Dougherty.....	7	1,746.00	249.428
Delivery.....	2	290.00	145.00
Station.....	4	861.00	215.25
Wagonettes, or passenger.....	10	2,816.19	281.62
Express.....	3	467.50	155.833
Ambulances (1900 pattern).....	6	1,397.00	232.833
Miscellaneous wagons.....	51	8,204.54	160.89
Sprinkling wagons.....	17	4,814.20	283.188
Carts:			
Dump.....	33	1,359.20	41.17
Sanitary.....	50	10,267.00	205.34
Spring.....	1	55.00	55.00
Hand.....	160	2,662.94	16.643
Trucks:			
1-horse.....	1	466.75	466.75
2-horse.....	7	2,530.00	361.428
4-horse.....	2	946.75	473.375
Sleighs.....	9	404.00	44.888
Bicycles.....	156	4,733.50	30.343
Harness:			
Single sets.....	1,958	36,398.92	18.59
Double sets.....	142	5,436.50	38.285
Cart.....	12	357.90	29.825
Dog.....	96	238.50	2.484
Sleds.....	23	778.00	33.83
Saddles, riding.....	121	3,058.79	25.279
Portable, vacuum wagon.....	1	2,000.00	2,000.00
Total.....		1,020,577.04	

Comparison with last year's report shows both increases and decreases in the prices paid for animals and in manufactured articles purchased.

During the fiscal year 1,861 animals were condemned, sold, etc., and 1,690 died, a total of 3,551 animals. There remained on hand on June 30, 1909, cavalry horses, 13,848; artillery horses, 3,477; draft horses, 2,087; young horses, 859; mules, 11,018; bulls, 14; dogs, 219; a total of 31,522 animals.

Issues to the militia.—Miscellaneous supplies to the value of \$18,134.88 were issued to the organized militia during the fiscal year under authority of statutes providing for such issues. The department's appropriations are reimbursed this cost from the militia appropriations. No gratuitous issue was made to the organized militia of the District of Columbia during the fiscal year.

REMOUNT SERVICE.

Fort Keogh, Mont., having been abandoned as a garrisoned post, the reservation has been turned over to this department and a second remount depot established there. This depot was not in full operation at the close of the fiscal year, but good progress was being made in completing its arrangement and securing a stock of young animals to be prepared for issues.

The stock of 845 animals at the Fort Reno, Okla., depot at the close of the fiscal year has reached a point where issues as provided by General Orders 121, War Department, 1909, were commenced during the current year. This will enable comparisons to be made between the remounts purchased and put into immediate service and those furnished from the depots. It is confidently expected that the test will prove altogether favorable to the animals issued from the depots, that their period of serviceability will be longer than that of the aged horses, and that eventually the mounted service will be supplied entirely from the depots.

TRANSPORTATION.

Evacuation of Cuba.—The most extensive transportation operation of the fiscal year was that involved in the evacuation of Cuba by the American forces, necessitating the transportation of about 5,000 troops, 2,500 animals, and the accompanying impedimenta, supplies, etc., from Cuban to United States ports. The War Department orders (G. O. 213, War Dept., 1908) required this evacuation to begin January 1, 1909, and be completed not later than April 1, 1909. The directions of this order were carried out in accordance with the regulations of the decentralization system of the Quartermaster's Department by the chief quartermaster of the Cuban expedition, under direction of the commanding general of the expedition, the last of the troops sailing on April 1, 1909. The movement was made without delay or casualty and the troops arrived at their final stations in the United States in good condition. The dispatch and ease with which this movement was accomplished, without instructions from this office other than the general directions for operations under the decentralization system, show conclusively the thorough efficiency with which field operations may be conducted according to that method.

Settlement of Pacific Railroad debt increases expenditures for transportation.—The Secretary of the Treasury by Treasury Circular No. 59, dated July 28, 1908, notified all concerned that the debt of the Central and Western Pacific railroad companies (now part of the Southern Pacific system), on account of subsidy bonds issued by the Government in aid of the construction of the roads, was adjusted, and that compensation for transportation services rendered by said companies

remaining due and unpaid, and compensation for like services thereafter rendered, should be paid to the proper company or companies in cash. The cancellation of this bonded indebtedness has caused a marked increase in the expenditures from the appropriation of the Quartermaster's Department for "Transportation of the army and its supplies." Prior to the settlement of this debt no cash payments were made for service over these bond-aided roads, all accounts for such transportation services being adjusted by the accounting officers of the Treasury by a credit on the debt due the Government from these roads. Such credits have in the past aggregated about \$350,000 a year, and as, since July 28, 1908, payments must be in cash, a corresponding increase in Quartermaster's Department appropriations is necessary to make the cash payments heretofore credited on the indebtedness of these roads.

Statement showing transportation furnished during fiscal year 1909, exclusive of the Philippine Islands and the army transport service.

	Railroad.	Commercial ves- sels.	Wagon.	Stage.	Express.	Government ves- sels. ^a	Grand total.
Passengers:							
Officers.....	4,809	647	140	41		69,068	74,705
Enlisted men.....	112,397	24,231	1,227	519		976,597	1,114,971
Civilians.....	4,780	2,352	48	35		737,075	744,299
Total.....	121,995	27,230	1,415	595		1,782,740	1,933,975
Animals:							
Horses.....	14,185	2,003				468	16,656
Mules.....	6,386	4,469				529	11,384
Total.....	20,571	6,472				997	28,040
Stores (tons):							
Quartermaster.....	61,724	50,144	9,890	28	139	35,209	157,124
Subsistence.....	26,259	10,964	8,289	6	489	13,672	59,679
Ordnance.....	29,514	11,921	3,548		52	10,197	55,232
Medical.....	1,551	964	778		25	499	3,787
Signal.....	2,628	1,008	246		37	1,577	5,496
Miscellaneous.....	21,249	6,675	24,601		37	30,561	83,123
Total.....	142,925	81,676	47,342	34	779	91,685	364,441
Remains.....	178	15	12	1	110	43	359
Funds.....		\$14,676			\$11,063,130		\$11,077,806

^a Includes all passengers carried on government ferryboats plying between military posts and adjacent cities.

Compared with last year there was an increase of 359,534 passengers, 14,377 animals, 9,199 tons of stores, 180 remains, and \$6,606,-377.23 of funds. There was a gratifying decrease of 327 tons in the quantity of stores transported by express, which seems to confirm the opinion expressed in last year's annual report that no good reason existed for the marked increase then shown in such shipments over the preceding year. It is believed that with the exercise of care in making timely requisitions and by promptness in filling them still further reduction could be made in express shipments, until finally no supplies need ordinarily be shipped in this manner, except small packages, valuable or fragile articles, or delicate instruments. The bulk of express shipments have been for the quartermaster's and subsistence departments. Considering the nature of

the supplies they handle, it would seem that by making timely requisitions and filling them promptly the express shipments of those departments really should be smaller than those of some of the other departments.

Statement showing transportation furnished during the fiscal year 1909 in the Philippine Islands, exclusive of the army transport service.

	Railroad.	Water.	Wagon.	Express.	Grand total.
Passengers:					
Officers.....	447	76	354	.....	877
Enlisted men.....	2,539	403	1,335	.....	4,277
Total.....	2,986	479	1,689	.....	5,154
Animals:					
Horses.....	434	76	.....	.....	510
Mules.....	112	11	.....	1	124
Total.....	546	87	.....	1	634
Stores (tons):					
Quartermaster.....	15,767	13	2,588	2	18,370
Subsistence.....	5,040	2	1,230	94	6,366
Ordnance.....	767	9	178	.....	954
Medical.....	62	.....	54	.....	116
Signal.....	122	1	80	.....	203
Miscellaneous.....	756	10	1,427	7	2,200
Total.....	22,514	35	5,557	103	28,209
Funds.....	\$32,178.82	\$81.61	.....	.....	\$32,260.43
Remains.....	7	.....	.....	.....	7

Shipments in deep-sea commercial vessels.—There were shipped from the United States in American bottoms to Philippine, Cuban, Porto Rico, Alaskan, and foreign ports 15,780 tons of supplies, 2,079,743 board feet of lumber, and 222 passengers, at a cost of \$265,593.44; in foreign bottoms to Philippine and foreign ports, 24,951 tons of supplies and 4,184,301 board feet of lumber, at a cost of \$77,283.13; a total of 40,731 tons of supplies, 6,264,044 board feet of lumber, and 222 passengers, at a cost of \$342,876.57.

ARMY TRANSPORT SERVICE.

Eighteen ocean-going steam vessels are owned and operated as required for the transportation of troops, animals, and supplies. San Francisco, Cal., is the home station of 7 of the vessels, Newport News, Va., of 5, Seattle, Wash., of 2, and 4 are engaged in the Philippine inter-island service. Every vessel has been in active use during some portion of the fiscal year, except the *Sherman*, which was being overhauled, and the *Ingalls*, which is not suitable for a troop ship and has been turned over to the Navy Department for use as a parent ship for submarines.

Sailings.—On the Pacific monthly sailings have been maintained from San Francisco to the Philippines, and one extra round voyage was made by the *Crook* to meet transportation needs. Two sailings were made from Seattle, Wash., by the *Dix*, carrying animals and supplies.

On the Atlantic semimonthly sailings were maintained between Newport News, Va., and Habana, Cuba, until the evacuation of Cuba,

and the transports *Sumner*, *McClellan*, and *Meade* were utilized in the evacuation movement. The *McClellan* also was used to effect changes of station among the garrisons of coast artillery posts. The *Kilpatrick* made one voyage from New York City to Manila and return via the Suez Canal, carrying troops and supplies each way.

Work of the transports.—There have been carried 32,291 passengers, 1,123 animals, 112,576.63 tons of freight, 208 remains, 353,484½ pounds of mail, and 25,991,666.97 dollars or pesos of money without serious casualty or loss.

Earnings and expenses.—Considering only the passengers and cargo for which transportation charges are properly payable from an appropriation of the United States or the Philippine insular government, the gross earnings of the transports during the fiscal year, based upon the lowest rates offered for similar service by commercial lines, have been \$2,840,365.87; based upon public commercial rates, \$2,965,675.99. The expenses of operation and maintenance of the service (excluding the *Burnside*, not operated in the interest of the Quartermaster's Department) were \$2,499,467.56. The saving to the Government over the cost of similar service at the lowest rate offered was \$340,898.31, and over public commercial rates \$466,208.43.

In addition to and not included in the above earnings families of officers and enlisted men of the army and navy, of employees of the Federal and Philippine governments, etc., not entitled to transportation at public expense, have been transported, the value of which at lowest rates offered would be \$505,889.40, and at regular commercial rates \$507,214.07.

Services for other departments.—The value of these aggregates \$530,207, of which \$404,182.02 was for the navy, \$76,218.75 for the Post-Office Department, \$46,223.92 for the Philippine government, and \$3,582.31 for the Treasury and other departments.

THE PHILIPPINE INTER-ISLAND SERVICE.

Owned vessels.—Four regular transports (the *Liscum*, *Seward*, *Warren*, and *Wright*) have been maintained and operated during the year carrying passengers, animals, and freight to the various ports of the Philippine Islands. Seventy-six voyages, aggregating 1,291 running days, were made by these vessels, carrying 12,595 passengers, 2 remains, 791 animals, 78,640 tons freight, 1,411,081 feet lumber, \$876,504.53 in currency entitled to government transportation, the value of which at commercial rates was \$496,711.76. There were also carried 6,339 passengers and 1,134 tons of freight for which no credit was taken. The expenses of this service aggregated \$435,122.67.

After allowing the proper proportion for shore expenses chargeable to this service (\$135,638.60), the net loss for the operation of the service over the cost of similar service at commercial rates was \$74,049.51.

Chartered vessels.—During the year there have been under charter three dispatch boats, as follows: The *Mindanao*, for the commanding general, Philippine Division, with home port at Manila; the *Sabah*, for the commanding general, Department of Mindanao, with home port at Zamboanga; and the *Mindoro*, for the commanding general, Department of the Visayas, with home port at Iloilo. These vessels have made 131 voyages to island ports, carrying 3,650 passengers, 2,009 tons freight, 1 animal, and \$7,705.95 in money, the value of

which at commercial rates was \$34,975.76. There were also transported 1,276 passengers for which no credit was taken.

The expense of this service was \$98,478.39. After charging a fair proportion of the expenses connected with the shore establishment maintained at the several ports in the Philippine Division (\$30,907.49), the net loss connected with this service was \$94,410.12.

Recapitulation.

	Credits.	Expenditures.
Pacific and Atlantic service.....	\$2,840,365.87	\$2,499,467.56
Philippine owned service.....	496,711.76	570,761.27
Philippine chartered service.....	34,975.76	129,385.88
Total.....	3,372,053.39	3,199,614.71
Net earnings of the entire transport service.....		172,438.68

HARBOR-BOAT SERVICE.

Owned service.—The department has operated during the fiscal year, in the various harbors along the Atlantic and Pacific coasts and the Gulf of Mexico, 6 first-class steel mine planters, 2 cable steamers, 1 ferry steamer, 6 first-class harbor steamers, 8 second-class harbor steamers, 29 third-class harbor or artillery steamers and tugs, 6 wooden tugs, 3 lighters, 16 first-class launches, 4 second-class launches, 17 third-class launches, 27 junction box launches, a total of 125 owned vessels engaged in quartermaster's, artillery, and signal work, at a total expenditure for wages of officers and crews, fuel, supplies, etc., of \$965,821.85. These vessels carried during the year 1,744,145 passengers and 130,654,214 pounds of freight.

Chartered service.—To supplement the above, chartered vessels were in operation for the service at Fort Caswell, N. C., at a cost of \$7,825; at Fort Fremont, S. C., at a cost of \$5,235; and at Fort Greble, R. I., at a cost of \$12,620. Artillery service was also rendered by these vessels whenever required. The entire cost of this chartered service, including the hire of substitute vessels and tugs for towing targets, vessel tracking, subcaliber practice, and like purposes for the coast artillery, which could not be performed by the other vessels of the service, amounted to \$37,008 during the fiscal year.

Unserviceable vessels condemned and sold.—The 87-foot tug *Reilly*, in service at Fort Constitution, N. H., was sold for \$1,929.87; the 46-foot lighter *Captain Godfrey*, at Fort Totten, N. Y., for \$86; the hull of the 45-foot launch *Lancaster*, at Jackson Barracks, La., for \$166; and the hull of the 30-foot launch *M. G. Krayenbuhl*, at Fort Monroe, Va., for \$5, the machinery of the latter two launches being retained for further use. The *Mercedes*, a 35-foot launch captured during the Spanish-American war, not being suitable for quartermaster's purposes, was transferred to the Bureau of Fisheries, Department of Commerce and Labor.

Construction work.—Plans and specifications have been prepared and contracts awarded during the fiscal year for the construction of

the following vessels required to provide additional water transportation where needed:

One steel harbor steamer, length 120 feet, cost \$78,833.33.

One steel double-end ferryboat, length 114 feet, cost \$88,846.

Six wooden steamers, length 65 feet, cost \$114,575.

One gasoline launch, length 26 feet, cost \$1,994, for cable steamer *Joseph Henry*.

The wooden steamers were completed during the year and named *Lieutenant E. F. Koehler*, *Lieutenant Wm. H. Smith*, *Lieutenant Wm. F. Schenck*, *Lieutenant W. L. Murphy*, *Lieutenant J. A. Gurney*, and *Captain Anton Springer*, and assigned to stations. The 26-foot gasoline launch has been completed, accepted, and assigned to the cable steamer for which intended. Work on the steel harbor steamer and the ferry steamer is progressing satisfactorily and it is expected they will be in service during the fiscal year 1910.

Up to 1903 the harbor-boat service comprised a total of 53 boats, engaged in transportation of freight, passengers, mail, etc. This number was made up of 1 ferry steamer, in operation between New York City and Governor's Island; 1 first, 1 second, and 4 third class harbor steamers; 13 tugboats, ranging in length from 60 to 105 feet, several of which were built during the period from 1875 to 1883; 3 first-class steam lighters; 2 second and 1 third class lighter; 4 first-class, 9 second-class, and 14 third-class launches. These vessels were stationed at various fortified ports on the Atlantic, Gulf, and Pacific coasts.

The harbor-boat service has been gradually increased during the succeeding years as funds became available and the necessities of the service, particularly the increase in the coast artillery, demanded. During the fiscal years 1908 and 1909 a number of new boats were added to the service, principally for artillery work, special appropriations having been made by Congress for this purpose.

As new boats have been placed in commission, old and unserviceable ones purchased at the outbreak of the Spanish-American war, or previous to that time, have been condemned and sold, because their design was not suited to the requirements and the cost of their operation was excessive on account of the extensive repairs continually required. Standard types of steamers and launches were adopted for all new additions to the service, providing types which furnished reasonable speed and good passenger and freight accommodations, combined with seaworthiness, handiness, and economy of operation.

In the Quartermaster-General's Annual Report for 1905 descriptions of standard steamers of the harbor and coastwise service of the Quartermaster's Department were given, but the first distinctive mention of the service is in the 1906 annual report. The number of owned vessels had then increased to 78. This increase in numbers does not, however, properly represent the growth of the service, because many of the new boats replaced old ones which had been disposed of, and while the total number was not much changed, the efficiency, capacity, and appearance of the service had been vastly improved.

During the fiscal years 1906 and 1907 three second-class steel harbor steamers, four 86-foot artillery steamers, and four 60-foot cabin artillery launches were constructed and placed in commission, increasing the total number of owned boats in the service to 85, four older

boats having been disposed of. All the new construction was in accordance with plans and specifications prepared by this office.

The vessels mentioned in my last annual report as then building under contract have been completed, named, and assigned to stations, as follows:

Three of the mine planters were completed on time and named, in the order of their completion, *General S. M. Mills*, *General J. M. Schofield*, and *General R. T. Frank*, and placed in service. Completion of the fourth mine planter was delayed until after the close of the fiscal year, but it has since been finished and placed in service, being named the *General E. O. C. Ord*.

The stern-wheel river steamer was completed during the year, named the *General J. W. Jacobs*, and placed in service on the Yukon River, Alaska.

The cable steamer was completed and placed in service in March, 1909, and named the *Joseph Henry*, in honor of the noted scientist and electrician.

Eight of the artillery steamers were completed during the year and named, in the order of their completion, *General Robert Anderson*, *General Richard Arnold*, *General R. B. Ayres*, *General J. M. Brannan*, *General Harvey Brown*, *General G. W. Getty*, *General R. H. Jackson*, *General A. M. Randol*. They have been assigned to permanent stations in artillery districts along the Atlantic coast and are rendering excellent service.

The other two artillery steamers were not completed at the close of the fiscal year, but have since been finished, named the *Captain James Fornance* and *Captain Gregory Barrett*, and placed in service on the Pacific coast.

The four 60-foot wooden gasoline launches were completed, named the *Captain W. H. Wilhelm*, *Lieutenant Ward Cheney*, *Lieutenant E. E. Downes*, and *Lieutenant W. C. Neary*, and assigned to permanent stations on the Atlantic and Gulf coasts.

The 32 junction box launches were completed on time and assigned one each to the various artillery districts on the Atlantic, Pacific, and Gulf coasts, and 6 to the Philippine Islands for use in artillery districts there. The boats are numbered serially instead of being named.

DESCRIPTIONS OF NEW VESSELS.

First-class mine planters.—These steamers are modifications of the first-class torpedo planters described in the 1906 annual report, for service in planting submarine mines or torpedoes, and for instruction purposes in connection with such work at coast artillery posts. They are of double bottom steel construction, the hulls being divided into seven water-tight compartments. The principal dimensions are: 165 feet long, 32 feet beam, draft 10 feet, the propelling power consisting of two compound vertical inverted condensing engines, developing approximately 1,100 horsepower, driving the vessel at a speed of 13½ miles per hour. Steam is supplied by two horizontal Scotch boilers with three furnaces each, working at a pressure of 150 pounds per square inch. The auxiliary machinery consists of electric lighting plant and searchlight, hoisting apparatus, steam windlass, steam steering gear, sanitary and fresh-water systems for supplying running water throughout the vessel, the usual boiler feed pumps in duplicate,

independent air pump, centrifugal circulating pump, and donkey, bilge, and fire pumps.

The vessels have a freight capacity of about 80 tons, with stores for a crew of about 40 men. Living accommodations, such as berthing quarters, lavatories, baths, galleys, and mess rooms are provided for the ship's crew and 20 enlisted men; also cabins, dining saloon, bathroom, pantry, etc., for four army officers.

Artillery district steamers.—These steamers are for general use in artillery work and instruction work in planting submarine mines similar to first-class mine planters; also for vessel tracking, towing regular service and subcaliber targets for artillery drills; dispatch service, searchlight drills, transportation of officers and men, as required by the district commander; and for work in connection with semimonthly inspections, visits of officers to subposts, visits of district staff in execution of official duties, visits of ceremony by district commanders, etc. They are of steel construction, with principal dimensions as follows: Length, 98 feet; beam, 22 feet; draft, 8 feet 6 inches, the hulls being subdivided into six water-tight compartments. The propelling machinery consists of one compound vertical inverted condensing engine developing about 350 horsepower and driving the vessels 11 to 12 miles per hour. Steam is supplied by one horizontal Scotch boiler with two furnaces, at a working pressure of 150 pounds per square inch. The auxiliary machinery of these steamers is very similar to that of the first-class planters above described. Sleeping accommodations and galley are provided for a full crew of 8, their freight capacity is about 20 tons on deck and in forward hold, and passenger capacity about 150.

Small wooden tugs.—These tugs are for service in the transportation of passengers and package freight, mail, commissary supplies, etc., at posts or to subposts where larger vessels are not required; also for artillery service such as towing subcaliber targets, vessel tracking, dispatch service, searchlight drills, official visits, etc., as required by regulations. They are single-screw steamers, with trunk cabin and freight space on main deck forward and under pilot house. The hulls are subdivided into four water-tight compartments by steel bulkheads. The principal dimensions are: Length, 65 feet; beam, 13 feet; draft, 5 feet, with a speed of 10 miles per hour. The entire framework, ribs, knees, beams, etc., are of best quality oak, planking of hard pine, decks of Oregon pine. The propelling power consists of one compound vertical inverted condensing engine developing about 100 horsepower, steam being supplied by a water-tube boiler of 700 square feet heating surface, at a working pressure of 200 pounds per square inch. There are the usual feed pumps in duplicate, centrifugal circulating pump, and horizontal air pump; also an injector for boiler feed.

They have a capacity of about $3\frac{1}{2}$ tons package freight, 15 officers, and 40 to 50 troops.

First-class or 60-foot gasoline launches.—These launches are for service similar to that mentioned above for the 65-foot steamers. They are single-screw, trunk-cabin boats, with raised pilot house forward. The entire framework, ribs, knees, beams, etc., are of best quality oak, planking hard pine, and deck of white pine. The hulls are subdivided by four water-tight steel bulkheads. The principal dimensions of the hull are: 60 feet long, 12 feet beam, and 3 feet 10

inches draft. The propelling power consists of one 4-cylinder, 4-cycle gasoline engine, developing approximately 100 horsepower, and driving the boat at a speed of 11 miles per hour. Special precautions were taken to insure the proper storage of the fuel aboard these boats with a view to eliminating danger from explosion and fire. The engines are fitted with the usual cooling water pumps, fuel pump, power air whistle, and in addition the boat is supplied with a power bilge and fire pump of special design.

Junction-box launches.—These launches are used as working boats in making up the joints of numerous submarine electric cables into a large metallic junction box, about 27 inches in diameter, which box is then placed overboard and lowered to the bottom of the bay or river where the operations are progressing after the cable joints are completed, or hoisted again to the surface if desired. The weight of the box with cables attached is about 2,500 pounds. The launches are also suitable for towing two yawl boats, lashed side by side, supporting a sufficiently large coil of submarine cable to span the distance from the junction box or mine planter to the shore. They are constructed of wood throughout with the exception of the steel water-tight bulkheads which divide their hulls into three water-tight compartments. The principal dimensions are: Length, 32 feet; beam, 9 feet; draft, 2 feet 10 inches. (Ten of these launches were constructed with 10-foot beam to give additional buoyancy for handling junction boxes and cables in very deep harbors.) They are provided with canopy top and side curtains on metal frame over the cockpits. The propelling power consists of one 12-horsepower gasoline engine, driving the boat at a speed of 8 miles per hour. The material of construction of these launches is practically the same as that for the first-class gasoline launches except the hull planking, which is of cedar.

PHILIPPINE HARBOR SERVICE.

There have been maintained and operated at Manila and other Philippine Island ports 49 owned launches and 191 lighters, lorchas, and other small craft, at a total cost of \$314,215.12, including the proper proportion of the expenses of the shore establishment. There were transported during the year 318,582 passengers and 26,719,980 pounds cargo.

The department has purchased during the year 1 launch, 8 steel lorchas, and 10 other small vessels, at a total cost of \$96,192.17, and sales of condemned and unserviceable means of water transportation amounted to \$1,385.55. One launch, the *Natchez*, and one steam lighter, the *Harrisburg*, were lost at sea.

The expenditure in connection with the charter of launches, lighters, and other small boats has been materially reduced by reason of the new vessels purchased and has only amounted to \$16,388.51, a reduction of \$30,966 from last fiscal year.

The mine planters *General Henry J. Hunt* and *General Henry Knox* and six 32-foot junction-box launches were sent to the Philippine Islands during the year for use of the coast artillery.

CLOTHING AND EQUIPAGE.

There was appropriated by Congress for the supply of clothing, camp, and garrison equipage for the fiscal year 1909, \$7,000,000;

credits from issues to the organized militia, sales to officers, etc., amounted to \$1,309,472.28; total, \$8,309,472.28; remittances to officers for payment of expenditures chargeable to this appropriation amounted to \$7,798,426.15, leaving a balance in the Treasury, June 30, 1909, of \$511,046.15, from which must be paid liabilities incurred during the fiscal year remaining unsettled at its close.

Issues to the organized militia.—These aggregated \$956,794, an increase over last fiscal year of \$492,703.23. The appropriation of the Quartermaster's Department is reimbursed for these issues by Treasury settlements from the appropriations made by Congress for the benefit of the militia.

Sales to the organized militia.—These aggregated \$33,805.82, a decrease from last fiscal year of \$152,301.69. The proceeds of these sales are credited to the appropriation of the Quartermaster's Department, and available to replace the articles sold.

Gratuitous issues to the District of Columbia Militia.—These amounted to \$686.90, a decrease from last fiscal year of \$35,801.89. The appropriation of the Quartermaster's Department is not reimbursed for these issues.

Sales to other executive departments.—These amounted to \$14,998.17, a decrease of \$14,021.34. The appropriation of the Quartermaster's Department is reimbursed for these sales.

Improvements and changes.—These have been largely of a minor character and made only after careful consideration and practical test. Reports received have indicated that the quality and suitability of the supplies issued have been generally satisfactory, and that requisitions are, as a rule, filled with reasonable dispatch. The department is at all times studying to perfect the articles supplied, but does not favor changes until their utility has been thoroughly tested and established. The specifications for 67 different articles have been modified or revised during the fiscal year, with a view to commercializing them so far as possible, thereby increasing competition for their supply.

Service uniforms for tropical and summer wear.—At the time the khaki-colored cotton cloth was adopted for uniforms for tropical and summer wear it was the most suitable material available, but the department, almost from the first use of it, realized that improvement was possible, and has been persistently seeking a material which would not be subject to the objections urged against the cotton khaki. The result of the investigations and experiments was the selection of an olive-drab colored cotton cloth, dyed in the fiber with dyes and by a process which permits the cotton to be woven into cloth of a soft, pliable, and open texture, of permanent color, and cooler and more comfortable to wear than the old khaki. The process also permits use of a lighter weight cloth, an average suit weighing about 10 ounces less than of the old cloth.

The experiments with olive-drab cotton and wool mixed fabrics for tropical and summer wear, referred to last year, are being continued with a view to practical test whenever the material is properly perfected.

Pyramidal tents.—Reports of practical tests of pyramidal tents showing them to be superior to the conical wall tents, the former have been adopted and manufacture of the latter discontinued. The new tents accommodate eight regulation cots and provide consider-

able room for equipment. Their issue is to begin after the stock of the conical wall tents now on hand is exhausted.

Working and fatigue clothing, etc.—This clothing will hereafter be made from blue denim instead of the brown canvas heretofore used, as will, also, barrack bags.

The department is now manufacturing a bedding roll for field use, for sale to officers.

Delinquent contractors.—The department has been embarrassed in fully carrying out plans for a reserve stock within the time contemplated and in meeting the requisitions for some articles of clothing, especially olive-drab woolen service coats, through the impossibility of securing from some contractors a full compliance with their contract obligations. It may become necessary, in order to escape from such conditions in the future, for the department to itself undertake the manufacture of all articles of uniform clothing.

Medals and badges.—The President directed that a badge for service with the Army of Cuban Pacification be provided, and by request it was designed at the United States mint, Philadelphia, Pa. General Orders, No. 96, War Department, 1909, promulgates the President's directions, and fixes the service for which the badges are issued. The total number of all kinds of medals and badges distributed from commencement of issue to June 30, 1909, was as follows: Congressional medals, 3,807; civil war badges, 385; Spanish campaign, 5,630; Philippine campaign, 17,127; China campaign, 965; Indian campaigns, 1,382; certificate of merit, 228, and Cuban pacification, 1,450.

QUARTERMASTERS' ACCOUNTS AND PROPERTY RETURNS.

Money accounts.—As required by law (28 Stat. L., 211) an administrative examination is given the money accounts of all quartermasters by this office before they are transmitted to the Auditor for the War Department. The accounts are rendered monthly and the examination must be completed and the papers sent to the auditor in not to exceed sixty days after their receipt in this office. There were on hand July 1, 1908, 18 accounts awaiting examination; received during the fiscal year 1909, 4,147, making a total of 4,165; examined and transmitted to the auditor, 4,096, leaving 69 on hand June 30, 1909. These accounts are frequently so voluminous and heavy that they are packed in boxes and forwarded to this office by express, and boxes weighing 100 pounds or more, all money papers for one month, are sometimes received. They consist of the "account current," which must show, by appropriations and fiscal years, every cent of money received and disbursed by the quartermaster during the month for which rendered. Accompanying this paper must be vouchers to show for what purpose and by what authority every dollar expended was disbursed. Authorities for expenditures, quoted on vouchers, must be verified; it must be seen that authorized expenditures have been made from proper appropriations, and if not so made the mistake must be corrected and the disbursing officer advised; that the voucher is properly stated and certified by both the disbursing officer and creditor; items of purchase must be checked in such a way as to insure a proper check on reports showing purchases and those showing final disposition of articles and supplies.

There will be from one or two to sometimes over 1,000 of these vouchers, and each voucher may show a number of disbursements. In the case of pay rolls, the number of names may, and frequently does, run into several hundreds, and not infrequently to over 1,000. Each name on the roll must be checked as to period of service, amount and rate of pay, and authority for hire, and the data noted on the records of this office. If an employee has been paid on more than one date during the month, separate checkings and entries must be made for each payment. Certain employees at some of the larger depots are paid four times a month, and each such payment multiplies the work in the office making it and in this office by four.

Reports of open-market purchases or procurement of services are examined and the statements upon which approval is expected to be based are verified before being transmitted to the Secretary of War for his action.

In connection with the examination of the money accounts, a record is kept by appropriations and fiscal years of the disbursements by each officer serving in the Quartermaster's Department and of the sums due from him to the Government.

Requests for certificates of nonindebtedness are continually being received from officers closing their responsibility as disbursing officers or from the Treasury Department in connection with such matters, and certificates are furnished or the request replied to as conditions indicate to be proper.

About 400 certificates of deposit of public funds, pertaining to this department, deposited to the credit of the Treasurer of the United States, are received monthly for designation of the proper appropriation and fiscal year and statement of the purpose of the deposit.

The amount of correspondence involved with this examination and the related work is very great, while the whole volume of business in connection with these accounts continues exceedingly large in spite of all previous efforts to find a way to reduce it.

Property returns.—There were on hand July 1, 1908, awaiting examination, 237; received during the fiscal year 1909, 2,146; making a total of 2,386; examined, 2,005; remaining on hand June 30, 1909, to be examined, 378. Annual returns of militia officers received and examined, 47. In connection with this work, 6,541 letters were written.

A mere statement of the number of property returns received and examined gives little idea of the work involved in their preparation by quartermasters or in the examination, checking, and verifying of them in this office. Every quartermaster who is responsible for movable public property of whatever class or nature, supplied by the Quartermaster's Department, must prepare quarterly and forward to this office a return showing the quantities of each article on hand at the beginning of the quarter; received during the quarter; whether invoiced to him from another quartermaster, purchased, etc.; the disposition of any property issued, transferred, or sold, and the quantities remaining on hand at the close of the quarter. With the property return must be submitted vouchers to account for all property transactions, showing the sources from which property was received, the purposes for which issued, etc., and authority for any

sales or other disposition thereof. The number of different articles, kinds of supplies, property, etc., and the numbers or quantities of each vary greatly. Some returns will contain but a few different articles, small numbers or quantities of each, and few purchases, issues, transfers, etc. On others the number of different articles, etc., will run into the thousands and the numbers or quantities into tens and hundreds of thousands, while the receipts and issues or transfers are continual throughout the quarter, involving transactions ranging from the issue or transfer of single articles, like a bottle of ink, joint of stovepipe, hatchet, broom, shovel, etc., to carload lots of such property as machinery and horses, or such supplies as fuel and forage, etc. Each property return will be supported by vouchers ranging from one or two to, as has happened, nearly 3,000. A conservative estimate of the number of different articles or items on a quartermaster's property return would be about 500, and, on an average, each return is accompanied by about 300 vouchers, referring generally to a number of different articles or items of property. Each return is checked with the preceding one, and the vouchers accompanying are carefully examined as to form, statutory requirements, and to determine whether or not the property has been received or purchased, properly taken up, and all accounted for. The amount of labor involved in the preparation of these returns and in checking and examining them in this office is enormous. It requires over a month of careful work to complete the checking of many property returns, together with the examination of their accompanying vouchers, while those from the larger depots sometimes require six weeks or more.

CLAIMS.

Miscellaneous claims and accounts amounting to \$88,927.91 were settled during the fiscal year, and 29, amounting to \$1,381.90, remained unsettled at its close.

Confederate horse claims to the amount of \$22,332.50 were approved for payment during the fiscal year, leaving on hand a balance of the appropriation for such claims of \$36,428.05, and 559 claims on hand awaiting action.

The sum of \$6,100.05, for the payment of 56 claims for damages to private property, was included in the estimates submitted to the Sixtieth Congress at its last session, but no appropriation was made for the payment of this class of claims. There were subsequently received in the office 57 similar claims, amounting to \$4,740.90, making a total of 113 claims, amounting to \$10,840.95. This amount has been included in the estimates to be submitted to Congress at its next session. These claims are generally for small sums, the larger number of them being for damages incurred to buildings by heavy gun firing at military posts in their vicinity during practice drills. All the claims have been thoroughly investigated and the amount of actual damages incurred in each case carefully determined.

During the year 47 claims for quartermaster stores taken during the civil war, which had been investigated and disallowed under the provisions of the act of July 4, 1864, were transmitted to the Court of Claims or Department of Justice.

READING MATTER FOR ENLISTED MEN.

Newspapers and periodicals to the value of \$6,677.04 were furnished for the use of the enlisted men at military posts and stations in the United States, Cuba, Porto Rico, Hawaii, and Alaska, and recruiting stations in the United States. Reports received show an expenditure in the Philippine Islands of \$879.58 for this purpose, a total of \$7,556.62.

NATIONAL CEMETERIES.

The department has supervision of the 84 national cemeteries, in which interments on June 30, 1909, aggregated 359,285, an increase of 1,953 during the fiscal year. Four hundred and seventy-eight remains of federal soldiers and sailors were transferred from other burial places to national cemeteries.

The necessary repairs have been made to buildings, inclosing walls, fences, etc., and the grounds kept in good condition. Progress has been made, within the limits of funds available, toward construction of new buildings, flagstaves, etc., where needed and the old ones were beyond repair.

Roads to national cemeteries.—The government approach roadways to the various national cemeteries have been kept in repair so far as the funds appropriated for this work were available, the annual appropriation for this work stipulating that no portion of the funds shall be expended upon any part of such roads as may lie within the corporate limits of any city, town, or village.

The roads from the Cache River and from Mounds, Ill., to the Mound City (Ill.) National Cemetery were repaired and improved, and a road from Main street, in the city of Salisbury, N. C., to the Salisbury National Cemetery was constructed, from special appropriations for those purposes.

The road to the national cemetery at Fort Scott, Kans., was turned over to the city of Fort Scott under the provisions of an act of Congress approved March 4, 1907, and the maintenance of this road will hereafter fall upon the city.

Superintendents.—There are 76 superintendents of national cemeteries authorized by law. Two died and 2 resigned during the year. At the close of the fiscal year 74 superintendents and 2 acting superintendents were on duty. There were also 3 assistant superintendents, or probationists, on duty awaiting appointments as regular superintendents.

Headstones.—Seventeen thousand five hundred and fifty white marble headstones were furnished to mark the graves of soldiers, sailors, and marines buried in national, post, city, and village cemeteries, and civilians buried in national and post cemeteries.

Tablets.—Seventy-seven cast-iron tablets, authorized by Congress, 33 inches wide by 56 inches high, containing in copper electroplated letters the words of the Gettysburg address of the late President Lincoln have been manufactured for erection in the several national cemeteries and will be placed in position as expeditiously as possible.

A bronze tablet, authorized by Congress, has been made and placed in the national cemetery at Marietta, Ga., to the memory of the late

Henry G. Cole, who donated to the Government the land comprising the national cemetery.

Bringing home remains.—The remains of 211 persons who died abroad were brought to the United States under provision of law for bringing home the remains of officers and enlisted men of the Army, Navy, and Marine Corps, and civilian employees. When requested, the remains were shipped to former homes or delivered to friends, otherwise interment was made in national cemeteries.

Disinterring corps.—This corps is still maintained in the Philippines for disinterring and shipping to the United States for interment in national cemeteries, or shipping home when claimed by relatives, the remains of officers and enlisted men of the Army, Navy, and Marine Corps, and civilian employees of the army, who die in the islands. The field covered by the corps is extensive and remains are returned to the United States at the earliest practicable date which the health regulations and climatic conditions will permit.

DUTIES OF THE QUARTERMASTER'S DEPARTMENT.

Under existing laws the Quartermaster's Department, under the direction of the Secretary of War, provides the army with military stores and supplies requisite for its use, such as clothing and equipage, tents, band instruments, tableware and mess furniture, equipments for post bakeries, fuel, forage, stationery, lumber, straw for bedding for men and animals, all materials for camp and for shelter for troops and stores, furniture for barracks, such as bunks, benches, chairs, tables, lockers, heating and cooking stoves for use in public buildings, heavy furniture for officers' quarters, tools for mechanics and laborers in the Quartermaster's Department, furniture, text-books, papers, and equipment for post schools, reading matter for post libraries, wagons, ambulances, carts, harness, pack rigging, draft and pack animals, water supply, sewerage, plumbing, illuminating supplies, and heating for all military posts and buildings.

The department is also charged with the duty of transporting, by land and water, recruits, troops and their baggage, necessary agents and employees, munitions of war, equipments, and all articles of military supplies from the place of purchase to the several armies, garrisons, posts, and recruiting places. To this end it operates wagon and pack transportation, contracts with public carriers, operates boats and the vessels of the army transport service.

Under act of Congress amending section 1661, Revised Statutes, for arming and equipping the militia, this department supplies quartermaster stores, clothing, and equipage to the militia of the several States and Territories and transports the same to said States and Territories. It furnishes transportation for all military supplies furnished by the War Department to the militia of the several States and Territories for the permanent equipment thereof. It also transports property for other executive departments on request, payments therefor being made by the respective departments to the carriers upon accounts stated by quartermasters and forwarded for that purpose to the department for which shipment was made.

This department prepares the plans for and constructs and repairs all buildings at military posts, such as barracks, quarters, storehouses,

post exchange and gymnasium buildings, etc.; constructs and repairs hospitals; prepares plans for, installs, operates, and keeps in repair water, sewer, and lighting systems; drains, grades and improves grounds of military posts; builds and repairs wharves; constructs and repairs roads for military purposes; builds and repairs bridges; provides, by hire or purchase, grounds for military posts, stations, encampments, and buildings; supplies all horses for officers entitled to public mounts, for the cavalry, artillery, and for the Indian scouts, and for such infantry and members of the hospital corps in the field campaigns as may be required to be mounted; pays for all incidental expenses of the military service which are not provided by other corps.

The care and maintenance of national cemeteries is an additional duty of this department. It provides suitable headstones to mark the graves of all soldiers, sailors, or marines who served during the late war, including those who have been buried in private cemeteries and other burial places.

Section 1139, Revised Statutes, makes it the duty of the Quartermaster-General, under the direction of the Secretary of War, to prescribe and enforce a system of accountability for all quartermaster supplies furnished the army, or to officers, seamen, and marines.

Because of the great variety of supplies, materials, etc., constantly required by the Quartermaster's Department for its own use or issue to troops in the performance of its duties, other bureaus of the War Department and other executive departments find it convenient and advantageous to frequently call upon the department to furnish them supplies out of its stock for their own use and to pay for the same by a transfer of funds, or if the supplies are not in stock, these other bureaus and departments take advantage of the Quartermaster's Department's extensive and efficient purchasing facilities to request it to make purchases for them, either themselves paying the accounts or settling them by transfer of funds on the books of the Treasury Department.

There is seldom anything spectacular in the work of the Quartermaster's Department, and the labor of its administration, the multiplicity, complexity, and ramifications of its functions and vital importance of its duties are little understood by those not in actual close contact with its operations. There is never a moment from the time a soldier enters the service until his discharge when the Quartermaster's Department is not in close personal touch with him, nor from the time an organization is effected or a military expedition initiated until the disbandment of either is there ever an instant when the Quartermaster's Department is not performing important services in intimate connection therewith. No military organization can make a move, nor can any individual soldier, sleeping or waking, without in some way coming in contact with the work of the Quartermaster's Department.

In a business way the department is in constant contact with manufacturers of cloth, clothing, shoes, wagons, machinery, tools, heating and lighting apparatus; with railroad and water transportation companies; shipbuilders; dealers in horses and mules and forage; contractors for buildings; and manufacturers of and dealers in all supplies and materials relating to building, water and plumbing systems; contractors for grading, construction, installation, etc.

In time of peace the department must be always busy and alert. In time of war or emergency it must act promptly and with the greatest energy, in close cooperation with all other branches of the military service, for its paramount duty is to place troops and supplies where needed, and the importance of doing this with celerity, to anticipate emergency, or forestall an enemy is too well established to need more than reference.

PERSONNEL.

The personnel of the Quartermaster's Department comprises 96 commissioned officers, as follows: One brigadier-general, 6 colonels, 9 lieutenant-colonels, 20 majors, and 60 captains; 200 post quartermaster-sergeants; 200 enlisted men of the army general service detachment, West Point, and a large number of civilian employees distributed throughout the United States and insular possessions.

During the fiscal year, 1 officer retired, 5 were relieved by expiration of detail, 3 on account of promotion, and 1 for the good of the service, and 1 vacancy existed at the beginning of the year, making a total of 11 vacancies, all of which were filled by detail from the line as provided by law.

In addition to the above regular force, there were on June 30, 1909, by detail as acting quartermasters, 94 officers of the line on duty in the department, in the office of the Quartermaster-General, in charge of construction work at various posts, as assistants to chief or depot quartermasters, in charge of transports, or on other quartermaster's duties.

In some instances these acting quartermasters were performing the foregoing duties in addition to those of post, regimental, or battalion quartermaster, or of some other military duty pertaining to their station or the organization to which attached; in others the quartermaster's duty occupied their entire time and attention. The records of this office do not generally show whether an acting quartermaster is employed solely in the service of the department or performing that in addition to other military duties. No mention is made of regimental, battalion, or similar organization quartermasters, as, while they are employed in the work of the department, this office has no voice in their selection or movements.

During the year 10 post quartermaster-sergeants retired, 7 were appointed officers of the Philippine Scouts, 2 deserted, 1 was dishonorably discharged, and 1 purchased discharge, making a total of 21 vacancies, which were filled by appointment of sergeants from the line.

STATIONS OF QUARTERMASTERS.

The officers of this department, and those regularly detailed as quartermasters, for four years, under the act of February 2, 1901, and the line officers acting as quartermasters were, on June 30, 1909, engaged on duties shown by the following statement and explanatory text, viz:

Duty.	Officers of the quartermaster's department.						Officers of the line detailed as acting quartermasters.					Grand total.
	Rank.					Total.	Rank.				Total.	
	Brigadier-general.	Colonel.	Lieutenant-colonel.	Major.	Captain.		Lieutenant-colonel.	Major.	Captain.	Lieutenant.		
Quartermaster-General's office.....	1	2		4	6	13		1	1		2	15
General Staff.....				1		1						1
Detached duty, Panama Canal Commission.....				1		1						1
Chief quartermasters and assistants:												
Department of California.....			1			1						
Assistant.....										1	1	2
Department of the Colorado.....		1				1						1
Department of the Columbia.....				1								
Assistant (also disbursing quartermaster, Portland, Oreg.) a.....					1	2						2
Department of Dakota.....			1									
Assistant (also in charge of construction).....					1	2						2
Department of the East.....			1									
Assistant (also constructing quartermaster).....					1	2						2
Department of the Gulf.....				1		1						1
Department of the Lakes.....			1									
Assistants.....					2	3						3
Department of the Missouri.....				1								
Assistant.....					1	2				1	1	3
Department of Texas.....		1				1						
Assistant.....										1	1	2
Philippines Division.....						(b)						
Assistant in charge of land transportation.....					1							
Assistant in charge of water transportation c.....					1							
Assistant.....					1	5						
Report of assignment not received.....					1							
Post quartermaster, Fort Wm. McKinley.....					1							
Assistant to officer in charge of water transportation.....					1					1		9
At division hospital.....										1		
In charge of Batan Island, Philippine Islands, coal mine.....										1		
In charge of Overton-Keithly road.....										1		
Department of Luzon.....					1	1						1
Department of Mindanao.....				1		1						1
Department of the Visayas.....				1		1						1
General depots:												
New York, N. Y.....		1										
Assistants.....				2	1	4		1			1	5
Philadelphia, Pa.....				1								
Assistants.....					3	4						4
Jeffersonville, Ind. (temporarily in charge of the major assistant).....												
Assistant.....				1	1	2						2
San Francisco, Cal.....			1									
Assistant (also in general superintendent's office, army transport service) d.....					1	2						2
Manila, P. I. (also temporarily division chief quartermaster) b.....			1									
Assistants.....					1	2				1	1	3
St. Louis, Mo.....						(e)						
Assistant (also temporarily in charge of depot) e.....					1	1						1
Washington, D. C.....				1		1						1
Boston, Mass.....				1								
Assistant (also constructing quartermaster).....					1	2						2
Fort Keogh remount depot.....					1	1						1
Fort Reno remount depot.....					1	1						1
Assistant.....										1	1	1
Depots and purchasing and distributing offices:												
Honolulu, Hawaii (also constructing quartermaster and in charge of army transport service).....					1	1						1
Pittsburg, Pa.....		1				1						1
New Orleans, La. (also constructing quartermaster).....					1	1						1
Nagasaki, Japan.....					1	1						1
Seattle, Wash. (also in charge of army transport service, Puget Sound).....				1								
Assistant.....					1	2						2
Portland, Oreg. (also assistant to chief quartermaster, Department of the Columbia).....												(a)
Purchasing animals.....					1	1						1
Depot for animals awaiting shipment to Philippine Islands.....										1	1	

Duty.	Officers of the quarter-master's department.						Officers of the line detailed as acting quartermasters.						Grand Total.
	Rank.						Rank.						
	Brigadier general.	Colonel.	Lieutenant-colonel.	Major.	Captain.	Total.	Lieutenant-colonel.	Major.	Captain.	Lieutenant.	Total.		
Constructing quartermasters.....	1	14	15	.....	1	4	3	8	23	
Post quartermaster.....	1	1	1	.....	.....	.....	.....	.....	1	
Post and constructing quartermasters.....	*3	3	.....	.....	23	25	48	51	
Assistant to constructing quartermaster.....	2	2	2	
Constructing quartermasters (in addition to line or corps duties).....	2	1	.....	3	3	
Transport service:	
Manila, P. I.—	
Assistant to division chief quartermaster.....	(c)	
San Francisco, Cal.—	
Assistant to depot quartermaster.....	(d)	
On transports and other vessels.....	2	2	.....	.....	7	12	19	21	
Military prisons.....	† 1	2	3	† 1	.....	.....	.....	1	4	
En route changing stations.....	3	.....	.....	3	.....	.....	.....	.....	.....	3	
Inspecting supplies being manufactured.....	1	1	.....	.....	.....	.....	.....	1	
On leave of absence.....	3	3	.....	.....	.....	.....	.....	3	
Total.....	1	6	9	20	60	96	1	5	38	50	94	190	

RECAPITULATION.

Quartermaster-General's office.....	1	2		4	6	13		1	1		2	15
General Staff.....				1		1						1
Detached duty—Panama Canal Commission.....				1								1
Chief quartermasters b.....		2	4	4		2	12					12
Assistants to chief quartermasters a c.....						9				3	3	12
Philippines division (other than as assistants to division chief quartermaster).....					2	2			1	3	4	6
General depots—in charge b c.....		1	2	3	2	8						8
Assistants d e.....				3	9	12		1		2	3	15
Depots and purchasing and distributing offices—in charge a.....		1		1	4	6			1		1	7
Assistants.....					1	1						1
Constructing quartermasters.....				1	14	15		1	4	3	8	23
Post quartermasters.....				1		1						1
Post and constructing quartermasters.....					* 3	3			23	25	48	51
Assistants to constructing quartermasters.....										2	2	2
Constructing quartermasters in addition to line or corps duties.....								2	1		3	3
Transport service—shore duty c d.....					2	2						
On transports and other vessels.....									7	12	19	21
Military prisons—in charge.....				† 1		† 1	1					2
Assistants.....					2	2					1	2
En route changing station.....			3			3						3
Inspecting supplies being manufactured.....					1	1						1
On leave of absence.....					3	3						3
Total.....	1	6	9	20	60	96	1	5	38	50	94	190
In the United States.....	1	6	8	19	52	86	1	5	36	33	75	161
In the Philippine Islands.....			1	1	8	10			2	17	19	29
Total.....	1	6	9	20	60	96	1	5	38	50	94	190

* Recruit depots.

† Commanding and in charge of construction.

From the foregoing statement it will be seen that there were 15 more line officers acting as quartermasters than were shown by the table published in the Quartermaster-General's Annual Report for 1908. Of this increase 2 are on duty in the Quartermaster-General's office, 2 at general depots of the department, 4 in charge of construction, 2 post quartermasters in charge of construction in addition to other corps or line duties, and 4 on transports or other vessels, a

total of 18. There were 3 less line officers acting as assistants to chief quartermasters, making the net increase 15 line officers acting as quartermasters. By rank the increase was 1 lieutenant-colonel, 3 majors, 6 captains, and 5 lieutenants.

Thirteen quartermasters, including the Quartermaster-General, and 2 line officers, were on duty in this office, an increase of 3 officers over the number reported last year, when the following remark was made, viz:

This is double the number on such duty on January 1, 1898, but is rendered necessary by the increased volume of work. The clerical force of the office has been increased from 100 to 224, the volume of work in the department and the field of its operations greatly enlarged, as already explained. To relieve any of the above-mentioned officers at this time would be detrimental to the work of this office. In fact, it would be advantageous to have an additional officer to take up the duties of officers who may be sick or compelled to be absent from the office on temporary duty.

One officer was on duty with the General Staff, and one with the Panama Canal Commission in the Canal Zone, the same as last year, a virtual reduction of the number of officers of the department, as they were withdrawn from its duties.

Twelve officers were on duty as chief quartermasters, 1 of the Philippines Division, and 11 of departments. This is 2 less than last year. Withdrawal of the troops from Cuba rendered unnecessary 1 chief quartermaster, and the depot quartermaster at Manila was temporarily in charge of the office of division chief quartermaster, awaiting relief by one of the lieutenant-colonels en route changing stations. As the Philippines Division and the territorial departments are now arranged 13 quartermasters are required for this duty, and they should be officers of high rank, wide experience, and marked executive ability. Last year, when 14 quartermasters were on this duty, the following remark was made, viz:

This (14) is 6 more than were required for like duty January 1, 1898, and is made necessary because there are more such places. The number of quartermasters on this duty at the last date was the same percentage of the strength of the corps as those now on such duty constitute

The reduction of 1 in the number of Chief Quartermasters required is a reduction of only about one-half of 1 per cent of their ratio to the number of officers in the department.

The same total number (12) of quartermasters and line officers is on duty as assistants to chief quartermasters, but the proportion has been changed from 5 quartermasters and 7 line officers to 9 quartermasters and 3 line officers. They should all be quartermasters, and would be if officers of the department were available. Last year it was remarked that:

This is but 1 more than was on this duty January 1, 1898, and it is thought no one will question the need for an increased number at this time, as with the increase of the army the work of chief quartermasters has increased.

Each chief quartermaster should have at least 1 assistant, not only to aid him in his work, but to act in an emergency involving the chief's absence.

The chief quartermaster of the Philippines Division and chief quartermasters of the more important territorial departments will need additional assistants, provision for which is made in the increase advocated. The departments in which the additional assistants will be required will not always be the same, because of varying conditions, as the shifting of the volume of business, changes in strength of garrisons, etc. All chief quartermasters had assistants, as shown in the

preceding table, except in the Departments of the Colorado and the Gulf, in the United States, and of Luzon, Mindanao, and the Visayas, in the Philippines. At each of those headquarters some line officer has very probably been employed for a part or all of his time, by direction of the department commander, in performing such duties, or else undue reliance has been placed upon civilian employees.

The number of officers required to have charge of the general depots of the department has been increased 1, because of the establishment of the remount depot at Fort Keogh, Mont., making 10, instead of 9 last year. Eight is the number given in the table as on this duty, for the reason that the Jeffersonville and St. Louis depots were temporarily in charge of officers stationed there as assistants, until such time as arrangements could be made to send officers of proper rank to be depot quartermasters of each, upon the services of some of the officers on leave and en route changing station becoming available.

With reference to this service, the following remark was made last year, viz:

Nine quartermasters are on duty as depot quartermasters in charge of general depots, in which no reduction can be made. The depots are necessary for supply of the army, and officers must be in charge of them. At the principal ones, as New York City, Philadelphia, Jeffersonville, and San Francisco, they should be of high rank, the importance of the work demanding it. Seven quartermasters were required for this work January 1, 1898.

At the general depots the number of quartermasters on duty as assistants is 11, the same as last year, but the number of line officers (1) has been increased to 3, making 14 instead of 12 officers now on this duty. Concerning this service the following remark was made last year, viz:

Eleven quartermasters and 1 line officer are on duty as assistants to depot quartermasters, and this number can not be reduced without disadvantage to the administration of the depots and detriment of the interests of the service. An increased number of quartermasters is needed for this service, in order that there may be a greater degree of supervision and inspection of the purchase and manufacture of supplies by commissioned officers expert in certain lines. There should be additional assistants to the depot quartermasters at New York, Philadelphia, Jeffersonville, and San Francisco, Boston, Manila. * * * Eight officers were on this duty January 1, 1898, as against 12 now with the increased army and with vastly greater volume of supplies and number of employees to be handled and shipments and payments to be made.

At the minor depots, purchasing, distributing, and disbursing offices, the number of officers on duty will be the same as stated last year as soon as the return to duty of those on leave or en route changing stations renders it possible to designate an officer to relieve the assistant to the chief quartermaster of the Department of the Columbia from temporary charge of the Portland office.

As stated last year, it is absolutely necessary in the administration of the affairs of the department to maintain these offices, and no officers appear to have been required for this service prior to January 1, 1908, the business then being such that it was possible for the work now done by these officers to be done by the general depots or department chief quartermasters.

The number of constructing quartermasters is 15 quartermasters and 8 line officers, total 23, as compared with 15 quartermasters and 4 line officers, total 19, last year, an increase of 4, all line officers. Three officers acting as constructing quartermasters in addition to

line or corps duties are additional to the number last year. Two line officers are assistants to constructing quartermasters, while there was but 1 on this duty last year. Reference to the foregoing table will show that a number of other quartermasters were in charge of construction work in addition to other duties. The number of post and constructing quartermasters is 51, the same as last year, but the number comprises 3 quartermasters and 48 line offices, whereas last year it comprised 5 quartermasters and 46 line officers, showing a reduction of 2 quartermasters and a like increase in the number of line officers on this duty. Attention is invited to the remarks on "Construction work," beginning on page 41, Quartermaster-General's Annual Report for 1908.

One officer of the department only was quartermaster at a post, whereas 3 were last year, and many more should have been and should now be, as indicated by the table showing the probable duties of officers in time of peace under proposed increase.

Following are remarks submitted last year, when it was possible for 3 quartermasters to be assigned to duty at posts, viz:

Three quartermasters are on duty as quartermasters at large and important posts. They are needed where stationed, and there are posts needing officers of the department which can not be supplied from the present number because imperative need requires them to be on other duty. There were 5 quartermasters on this duty January 1, 1898, so that it is plain that the number now available for this duty does not correspond to the increase of the army and development in importance of posts, recruiting depots, and the different service schools. * * * At those posts where military schools are located and at several of the larger posts (where there are mixed commands) there should be a quartermaster and an assistant to satisfactorily perform the duties devolving upon the department. It has been necessary within the past year to reduce the number of quartermasters on this duty one-half to provide for other duties devolving upon the department, reluctantly leaving their duties to fall upon line officers.

One less quartermaster is on shore duty in connection with the army transport service. This is because after withdrawal of the troops from Cuba the quartermaster's depot and office of the transport service at Newport News, Va., was discontinued and the officer in charge assigned to duty as assistant to the chief quartermaster of the Department of the East.

The number of quartermasters "on transports and other vessels" shows an increase of four, all being acting quartermasters on the mine planters operated in connection with the seacoast defense service.

Four officers are on duty at military prisons as compared with three last year.

One quartermaster is specially employed in inspecting supplies being manufactured, the same number as last year.

Three quartermasters are en route changing station as compared with one last year, and three are on leave of absence, whereas none were when last year's statement was prepared.

Four quartermasters shown on duty in Cuba last year have been absorbed in the increases heretofore noted.

EXCESSIVE CHANGES OF STATIONS.

The occupation of the Philippine Islands has not only added to the department's work by extending the territory to be served and developing new problems of supply and transportation, but the

necessary interchanges of garrisons and of quartermasters between the islands and the United States have further complicated the administration of the department. The tour of service in the Philippines is two years, but in the case of individuals it is frequently shortened by illness, constitutional inability to withstand the climate, or for other good reason. The transfer of quartermasters to and from the Philippines always involves several changes of station in the United States and the transfers of troops involves changes among post quartermasters, and generally among officers acting as quartermasters, some of whom will belong to organizations going to the islands, which they will be required to accompany.

During the fiscal year 1909 nine quartermasters were relieved from duty in the Philippines and ordered to the United States and the same number ordered to the Philippines to replace those ordered home. As indicating the effect of this shifting process, attention is invited to the following data relative to changes in department chief quartermasters, depot quartermasters, etc., during the period beginning January 1, 1905, and ending June 30, 1909, four and one-half years:

Chief quartermasters and assistants.

Department.	Duty.	Number of different officers.	Average length of service.		
			Years.	Months.	Days.
California.....	Chief quartermaster.....	3	1	6	.....
	Assistant.....	2	2	3	.....
Colorado.....	Chief quartermaster.....	2	2	3	.....
	do.....	4	1	1	15
Columbia.....	Assistant.....	2	2	3	.....
Dakota.....	Chief quartermaster.....	2	2	3	.....
	Assistant.....	2	2	3	.....
East.....	Chief quartermaster.....	3	1	6	.....
	Assistant.....	5	.....	10	24
Gulf.....	Chief quartermaster.....	5	.....	10	24
	do.....	3	1	6	.....
Lakes.....	Assistant.....	4	1	1	15
	Chief quartermaster.....	4	1	1	15
Missouri.....	Assistant ^a	2	2	3	.....
	Chief quartermaster.....	2	2	3	.....
Texas.....	Assistant.....	3	1	6	.....
	Chief quartermaster.....	4	1	1	15
	Assistant.....	7	.....	7	21
Philippines Division	Assistant in charge of water transportation.....	5	.....	10	24
	Assistant in charge of land transportation.....	2	2	3	.....
Luzon.....	.....	5	.....	10	24
Mindanao.....	.....	4	1	1	15
Visayas.....	.....	4	1	1	15

^a Also depot quartermaster at Omaha, Nebr.

Depot quartermasters and assistants.

Depot.	Duty.	Number of different officers.	Average length of service.		
			Years.	Months.	Days.
Boston, Mass.	Depot quartermaster.	2	2	3	
	Assistant.	2	2	3	
Jeffersonville, Ind.	Depot quartermaster.	3	1	6	
	Assistant.	3	1	6	
	do. ^a	2	2	2	14
	do. ^b	0	1	6	
New York City.	Depot quartermaster.	3	1	6	
	Assistant.	3	1	6	
	do. ^c	0	1	7	12
	do. ^d	3	1	2	2
	do. ^e	0	1	8	25
	do. ^f	0		2	16
Philadelphia, Pa.	Depot quartermaster.	3	1	6	
	Assistant ^g	3	1	6	
	Assistant.	3	1	6	
	do.	4	1	1	15
St. Louis, Mo.	Depot quartermaster.	7		7	21
	Assistant ^h	2	1	4	10
	do. ⁱ	0		1	6
Washington, D. C.	Depot quartermaster.	2	2	3	
New Orleans, La.	Quartermaster.	3	1	6	
Pittsburg, Pa.	do.	4	1	1	15
Seattle, Wash.	do.	3	1	6	
Honolulu, Hawaii.	do.	3	1	6	
Manila, P. I.	Depot quartermaster.	5		10	24
	Assistant ^j	7		7	21
Nagasaki, Japan.	Quartermaster.	3	1	5	

^a Position vacant since May 15, 1909.

^b One officer from December 23, 1905, to May 1, 1906.

^c One officer from January 1, 1905, to August 1, 1906.

^d Dates from December 23, 1905.

^e Dates from October 15, 1907.

^f Dates from April 14, 1909.

^g Approximate average. Two officers were on duty from December 4, 1905, to January 22, 1906, and the position was vacant from January 12, 1907, to February 10, 1907.

^h Period begins October 9, 1906.

ⁱ From May 18, 1909, to January 24, 1909.

^j Approximate. During one period of about 8 months two officers were on duty.

Transport quartermasters.

Transport.	Duty.	Number of different officers.	Average length of service.		
			Years.	Months.	Days.
Buford ^a	Quartermaster.	6		7	15
Burnside	do.	3	1	6	
Dix	do.	4	1	1	15
Logan ^b	do.	3		11	13
Seward	do.	8		6	22
Sheridan ^c	do.	5		9	12
Thomas	do.	6		9	
Warren	do.	4	1	1	15
Wright ^d	do.	5		6	

^a Position vacant about 9 months.

^b Period begins March 9, 1905, and position was vacant 1 year 4 months 26 days.

^c Approximate. Position was vacant for about 7 months.

^d Approximate. Position vacant about 2 years.

NOTE.—Service of the other transports during the period was too irregular to furnish intelligible data.

CONSTRUCTING QUARTERMASTERS.

The difficulties of administration are strikingly shown by conditions in the construction work of the department. The following statement shows the number and grades of officers on duty in the United

States as constructing quartermasters on January 1, 1905, and on July 15, 1909:

Rank.	On duty January 1, 1905.				On duty July 15, 1909.			
	Quartermasters.	Line officers.		Total.	Quartermasters.	Line officers.		Total.
		De-tailed 4 years.	Acting quartermasters.			De-tailed 4 years.	Acting quartermasters.	
Colonels.....	1			1				
Lieutenant-colonels.....							1	1
Majors.....	3		2	5	3		1	4
Captains.....	13	13	11	37	7	15	24	46
First lieutenants.....			5	5	5		16	16
Second lieutenants.....			3	3			10	10
Total.....	17	13	21	51	10	15	52	77

Of the total number of officers on this duty at the beginning of the period, 33.33 per cent were quartermasters, 25.49 per cent were detailed quartermasters, and 41.17 per cent were line officers acting as quartermasters. Of the 77 officers on this duty at the close of the period, 12.98 per cent were quartermasters, 19.48 per cent were detailed quartermasters, and 67.53 per cent were line officers acting as quartermasters. There was a reduction of 41.17 per cent in the number of quartermasters and an increase of 15.38 per cent in the number of detailed quartermasters, and there was an increase of 147.61 per cent in the number of line officers. The number of lieutenants had increased from 15.68 per cent at the beginning of this period to 33.76 per cent at its close, the increase being 225 per cent.

During some part of this period important construction work was in progress at about 120 military posts and stations, but owing to a lack of officers it was superintended by constructing quartermasters, stationed at 80 offices, some of whom were compelled to supervise work at widely separated points. For instance, the constructing quartermaster at Baltimore, Md., had charge of the work at four forts—Howard, Armistead, Carroll, and McHenry, Md. To visit each fort once by the shortest route requires about 30 miles' travel by water.

The constructing quartermaster at Boston, Mass., had charge of the work at five forts—Warren, Strong, Revere, and Andrews, Mass., and Stark, N. H. To visit each of the first four forts once by the shortest route requires about 18 miles' travel by water. Fort Stark, N. H., is 60 miles from Boston.

The constructing quartermaster at Newport, R. I., had charge of the work at five forts—Adams, Greble, Getty, Wetherill, and Philip Kearny. To visit each once by the shortest route requires about 25 miles' travel.

The constructing quartermaster at New London, Conn., had charge of work at five forts—H. G. Wright, Terry, and Michie, N. Y., Trumbull, Conn., and Mansfield, R. I. To visit each post once by the shortest route requires about 46 miles' travel by water.

The constructing quartermaster at Washington, D. C., had charge of work at Walter Reed General Hospital, Brightwood, D. C.,

Washington Barracks, D. C., and Forts Washington, Md., and Hunt, Va. To visit each post once by the shortest route requires about 40 miles' travel.

The constructing quartermaster at Fort Mason, San Francisco, Cal., is in charge of work at forts in the vicinity of San Francisco, and chief and depot quartermasters are frequently compelled to assume charge of construction, in addition to their other duties, which are generally more than enough to keep them busy. Other instances could be cited, but it is thought these are enough to show how utterly impossible it has been and is to give proper supervision to work.

Changes at these offices were remarkably frequent. Of the 80 offices, at only 11 the officer in charge was not changed, 7 had two different officers, 13 posts three different officers, 15 posts four different officers, 15 posts five different officers, 7 posts six officers, 7 posts seven officers, 4 posts eight officers, and 1 post nine officers. The changes within a year were equally demoralizing. At 20 posts the officers in charge served a year or more, at 27 posts the greatest number of changes in any one year was two, at 11 posts three, at 2 posts four, and at 1 post five. The average period of service of constructing quartermasters during this period has been one year and twenty-nine days. Fifty of the eighty constructing quartermasters' offices had work under way during the whole of this period. At only 2 was there no change of officer in charge; there were two different officers at 3, three at 7, four at 12, five at 11, six at 5, seven at 5, eight at 4, and nine at 1. At some of these offices the construction work superintended amounted to hundreds of thousands of dollars, while a great deal of it was of a difficult and intricate character. The impossibility of establishing and carrying out any uniform policy, or securing the best possible returns for the money invested, under such circumstances seems plain. No business concern in the world could operate with such a shifting force and escape bankruptcy.

POST QUARTERMASTERS.

The conditions as regards post quartermasters are in the opinion of this office about as fruitful of wasteful and inefficient administration as they well could be. The following statement shows the number and grades of officers on duty in the United States as post quartermasters on January 1, 1905, and on July 15, 1909, as shown by the records in this office:

Rank.	On duty January 1, 1905.				On duty July 15, 1909.			
	Quartermasters.	Line officers.		Total.	Quartermasters.	Line officers.		Total.
		De-tailed 4 years.	Acting quartermasters.			De-tailed 4 years.	Acting quartermasters.	
Captains.....	1	6	29	36	1	3	34	38
First lieutenants.....			25	25			51	51
Second lieutenants.....			40	40			27	27
Total.....	1	6	94	101	1	3	112	116

A glance at the table will show the almost negligible proportion of quartermasters and of officers detailed as quartermasters for four years at both the beginning and end of the period. The one quartermaster and five of the six detailed quartermasters at the beginning of the period were also constructing quartermasters at the posts where stationed. Had their services not been necessary to superintend construction, it is almost certain they would not have been stationed at the posts. The remaining detailed quartermaster was at the large and important post of the Presidio of San Francisco, Cal. The one quartermaster at the close of the period was also assistant to the chief quartermaster, Department of the East, and the three detailed quartermasters were at recruit depots and also constructing quartermasters.

Of the 116 posts only 2 had one officer during the entire period. One of these was San Juan, P. R., where the quartermaster is an officer of the Porto Rican Regiment, and the other is Schofield Barracks, Hawaii, only established April 20, 1909. Six posts had two different officers during the period, 13 had three, 21 had four, 27 had five, 20 had six, 13 had seven, 8 had eight, 2 had nine, 1 had eleven, and 3 had twelve. At 25 posts the quartermasters served one year or more, at 49 the greatest number of changes in any one year was two, at 21 posts three, at 3 posts four, and at 1 post five. The average time of service of post quartermasters during the period has been eleven months and fifteen days. When it is considered that a quartermaster is charged with the care of the buildings, grounds, roads, and walks and of keeping them in repair; the operation of water, sewer, lighting, and heating systems and the keeping of them as well as the machinery connected therewith in repair; the care of draft and pack animals, and the receipt and issues of forage for them; the issues of clothing and equipage, fuel, and lighting materials; the issue and care of tableware, mess furniture, and cooking appliances; the payment of employees and extra-duty men; all transportation matters, etc., the extent to which the interests of the service suffer through these frequent changes and the necessity for some corrective measure that will insure more permanency in the assignment of officers to these duties will be understood. Changes at some of the posts have been so numerous that it would seem quartermasters could scarcely have found time between checking and receipting to their predecessors and checking and invoicing to their successors to inspect the property in their charge or become acquainted with the condition of their post and its needs. It is safe to say that no commercial concern would think of tolerating such a condition among its responsible agents and business representatives as is here shown to exist among the agents and representatives of this department at military posts. The results can only be wasteful and extravagant, no matter how hard the officers, who are the unfortunate victims of a bad system, may strive to manage carefully and economically.

The position of quartermaster is not established by statute nor by Army Regulations, except inferentially by paragraph 249, which provides that the quartermaster of a regiment "may be required to perform the duties of quartermaster at the post where he is stationed."

Paragraph 204, Army Regulations, provides that—

The staff of a post commander will consist of such staff officers as are on duty at the post, and such line officers as may be required for staff duty.

Consequently, when a post is garrisoned by a battalion, or less, the quartermaster is naturally a second lieutenant. Where, as is sometimes the case, the quartermaster at a regimental post or one with a mixed garrison is a first or second lieutenant, it is doubtless because the commands at such posts have been so depleted of officers of the higher grades that none are available for the position. The result is that the disbursement of considerable sums of the appropriations of this department, the accountability for supplies and stores of great value, the care of valuable buildings and improvements, and the responsibility for initiating and carrying out administrative work of importance devolves upon young officers of little experience, and in whose selection this department, although vitally interested, has no voice. It is not even required that this office be advised of the selection of organization quartermasters, who generally are also post quartermasters, nor when they are relieved by other officers. They are the selections of their commanding officers, and this office frequently is not advised of their detail until the information comes through necessary money or property transactions with them or is learned from the Army List and Directory, published by The Adjutant-General of the army.

Without wishing in the slightest to reflect unfavorably on the efforts of the young officers performing quartermaster's duties, it is realized that better results could be had if more experienced officers were generally employed as regimental and battalion quartermasters, and much of the labor saved of correcting and explaining money accounts, property returns and reports, and of issuing instructions. These young officers are, with few exceptions, zealous and energetic, but lack experience, and experience is of first importance among the qualifications of a quartermaster.

This office has already expressed the opinion that as regimental, battalion, and similar quartermasters are doing the work of the department they should be of its personnel, and their stations, duties, and assignments, subject to supervision by the Chief of Staff, should be under the direction of the Quartermaster-General; that the number of officers in the department should be increased to such an extent as to permit competent and experienced quartermasters to be detailed for service with the line, as post quartermasters, with troops in the field, etc., thus placing the department in closer touch with and bringing to it information as to evolving needs of the line and wherein supplies and services could be improved. Under the present system officers detailed from the line to the staff are so entirely occupied with learning the business of the department and performing duties immediately devolving upon them that the Quartermaster's Department is unable to learn anything from them as to the requirements of the line.

SCHOOL FOR INSTRUCTION IN QUARTERMASTER'S DUTIES.

One effect of these frequent changes of station is to largely increase the work of this office, especially in the examination of reports, money accounts, and property returns, and through correspondence relating to explanations thereof and corrections therein. The younger officers who are called upon to assume quartermaster's duties at posts or for organizations generally have had little or no

experience in the department's work and but slight training to fit them for it. The result is that this office is all the time conducting what might be called a correspondence school for their instruction. The average length of service scarcely gives time to make a good start in the course before a new student appears to replace the one who has made a beginning. In my two preceding annual reports the hope has been expressed that it could be found possible to devise a plan for the selection and instruction in connection with the service schools of a limited number of specially qualified officers with a view to their detail to fill vacancies in the department. This hope is still entertained, and the instruction might advantageously be extended to include such instruction as would fit officers for the duties of post, regimental, battalion, and like quartermasters.

INCREASE OF THE CORPS.

Further study of the need of an increased number of officers for the Quartermaster's Department has caused certain changes to be made in the draft of the proposed bill published in the Quartermaster-General's annual report for 1908, and in place of that draft the following is now submitted, viz:

A BILL to increase the efficiency of the Quartermaster's Department of the United States Army.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Quartermaster's Department of the army shall consist of one Quartermaster-General with the rank of brigadier-general; ten quartermasters with the rank of colonel; eighteen quartermasters with the rank of lieutenant-colonel; thirty-nine quartermasters with the rank of major; one hundred and seventeen quartermasters with the rank of captain, of which number sixty shall be appointed, and fifty-seven detailed in accordance with the act of February second, nineteen hundred and one, except as otherwise provided herein, and two hundred and fifty post quartermaster-sergeants.

SEC. 2. All vacancies in the grades of colonel, lieutenant-colonel, and major created or caused by this act and hereafter occurring in said grades shall be filled by promotion according to seniority, as now prescribed by law, and to fill original vacancies occurring hereafter in the grade of captain through promotion of the captains to be appointed, the President is authorized, by and with the consent of the Senate, to appoint officers from the army at large, from the grade in which the vacancy exists or from the grade below, and officers so appointed shall rank from date of appointment.

SEC. 3. That details of officers to the Quartermaster's Department under the provisions of the act of February second, nineteen hundred and one shall be limited to the fifty-seven captains herein provided for, and may be made from the grade in which the vacancy exists or the grade below, and officers so detailed may be again detailed for service in the department after they have served one year with the line, and in that event shall take rank from the date of their original detail in the Quartermaster's Department.

HOW DIFFERING FROM 1908 DRAFT.

This draft differs from the former one in the following respects, viz:

(a) The number of officers proposed.

There is an increase of one in the number of majors, due to a desire to place the lieutenant-colonel, who was contemplated to have general charge of the remount service, and in addition to that duty, of one of the remount depots, in general charge of the remount service only, and to put all the remount depots in charge of majors. The success of the remount system, established under authority of the act of May 11, 1908, making appropriations for the support of the

army (35 Stat. L., 119, 120), the improvement in the classes of animals supplied, the economy both in cost of supply and years of service of the animals, and the opportunities for further development and improvement along these lines, are the grounds upon which this change is based.

There is a decrease of 33 in the number of captains, due to the outcome of discussion of the subject and exchange of memoranda with other interested branches of the service. Eight captains contemplated for quartermasters of mine planters and 27 captains contemplated for quartermasters at artillery district headquarters have been dropped upon the representation that the coast artillery already has been given officers for these duties. Two captains contemplated for duty in the Philippines Division to be in charge of the Batan Island coal mine and the Keithly-Overton road, respectively, have been dropped upon the representation that these were temporary duties.

This makes a total reduction of 37 captains. Two new recruit depots have been established since the 1908 estimate was prepared, each of which will require a captain for quartermaster, and 2 more are now thought necessary for duty at posts than were then, making a total of 4, and a net decrease of 33.

It was with some hesitancy the captains for duty at the Batan Island mines and on the Keithly-Overton road were dropped; \$50,000 was spent to acquire title to certain private holdings in these coal fields, represented as being essential to the operation of the prospect developed on public lands, and about \$230,000 have been spent toward developing the mines. Upon the request of the Philippines Division authorities for \$1,500,000 and the representation that justifiable quantities of excellent coal have been demonstrated to exist, this office submitted an estimate for \$250,000 for their further development. While this was not granted, such quantities of coal as can be mined with funds and facilities available are being taken out, and practical tests show it to be of a fairly good quality. Should the quality of coal continue to be satisfactory, operations will doubtless be continued and the output increased as much as possible, especially in view of the fact that the repeal of the free-entry privilege to government supplies for the Philippines will greatly increase the cost of coal required there.

As to the Keithly-Overton road, that has for some time been in charge of an acting quartermaster, and this office was recently directed to employ expert civilian engineers to make a survey of the road, and submit necessary maps, drawings, plans, specifications, and estimates, with a view to converting this road into a steam railway. This project is now in abeyance, pending, it is understood, determination of whether or not the work shall be done by the Engineer Corps of the army. If, however, finally determined upon, the work of its actual construction, and its operation, will naturally devolve upon this department. The existing road has been constructed and is now equipped from the appropriations of the Quartermaster's Department, which must also provide for its upkeep. It is considered very probable that officers for both these duties will eventually have to be furnished from the line or from the officers of this department contemplated for "constructing, and post and constructing quartermasters, and special duty."

(b) The provision as to examination of officers to be appointed quartermasters and of line officers to be detailed for duty in the Quartermaster's Department is omitted.

The reason for this omission is that it is considered unnecessary, as the President is believed to have general authority to direct such examinations, and in the case of officers to be detailed, specific authority to prescribe examinations under the provision of section 26 of the act of February 2, 1901 (31 Stat. L., 755).

There are no other material changes in the draft for the bill, but the language has been changed somewhat with a view to expressing more clearly what is intended.

PROVISIONS OF THE BILL IN DETAIL.

(1) The Quartermaster's Department of the army shall consist of one Quartermaster-General with the rank of brigadier-general.

This contemplates no change whatever in the present law.

(2) Ten quartermasters with the rank of colonel.

This contemplates an increase of 4 in the number of colonels, the present authorized number being 6; and a change in title from "colonel and assistant quartermaster-general" to "colonel and quartermaster."

These officers are for the performance of the highest duties of the department, as assistants in the Quartermaster-General's office, chief quartermasters of divisions and the more important territorial departments, and to have charge of the principal general depots of the department, as shown in the table herewith and the explanatory text following it.

The change in the official designation is in the direction of conciseness. The term "assistant quartermaster-general" now in use is a remainder of an obsolescent system of official designations, and while it may sound important, means nothing, carries no authority, and is cumbersome.

(3) Eighteen quartermasters with the rank of lieutenant-colonel.

This contemplates an increase of 9 in the number of lieutenant-colonels, the present authorized number being 9; and a change in the title from "lieutenant-colonel and deputy quartermaster-general" to "lieutenant-colonel and quartermaster."

These officers are for the performance of duties of less importance than those contemplated for the colonels, as assistants in the office of the Quartermaster-General, in charge of territorial departments where the administrative functions are not so important or complicated as to require officers of the experience of colonels, and for the general depots, purchasing and distributing offices of secondary importance in administrative duties, the class or volume of supplies purchased, issued, or distributed, as shown in the table herewith and explanatory notes following it.

The change in official designation is based upon the same reason as in the case of colonels.

(4) Thirty-nine quartermasters with the rank of major.

This contemplates an increase of 19 in the number of majors, the present authorized number being 20, but no change in the title, that now being "major and quartermaster."

These officers are for duty in the office of the Quartermaster-General, on the General Staff, as assistants to officers in charge of general depots of sufficient importance to require an assistant in the administrative duties, to be in charge of purchasing and distributing offices for furnishing limited classes of supplies or serving the needs of limited territories, in charge of remount depots and engaged upon the purchase of animals, as post quartermasters at the large important posts of mixed garrisons where the administrative work of the department becomes more or less complicated, requiring broad experience and tact, and where the money and property responsibility is large, as assistants to the general superintendents of the army transport service, in charge of exceptionally important or extensive construction projects, and to have charge of military prisons, as shown in the table herewith and the explanatory notes following it.

(5) One hundred and seventeen quartermasters with the rank of captain.

This contemplates an increase of 57 in the number of captains, the present authorized number being 60, but no change in the title, that now being "captain and quartermaster."

These officers are for duty in the office of the Quartermaster-General, assistants to division and department chief quartermasters, assistants to the officers in charge of depots and similar offices, as assistants to quartermasters at posts where assistants are needed and as quartermasters at other posts of mixed garrisons where the work of the department is sufficient to require the services of an officer of the department but not presenting administrative problems of much complexity or requiring seasoned experience, for shore duty in the transport service as assistants to the general superintendents where required, as quartermasters of transports and cable steamers, constructing, and post and constructing quartermasters, miscellaneous duties, and as assistants to the quartermasters in charge of military prisons—as shown in the table herewith and the explanatory notes following it.

(6) Of which number sixty shall be appointed, and fifty-seven detailed in accordance with the act of February second, nineteen hundred and one, except as otherwise provided herein.

The other provisions in the proposed bill to which reference is made is section 3, viz:

(7) That details of officers to the Quartermaster's Department under the provisions of the act of February second, nineteen hundred and one, shall be limited to the fifty-seven captains herein provided for, and may be made from the grade in which the vacancy exists or the grade below, and officers so detailed may be again detailed for service in the department after they have served one year with the line. * * *

These contemplate the following changes in the present law, viz:

(a) That all the field officers of the department shall be permanently appointed as quartermasters.

(b) A division of the authorized number of captains into two classes.

(c) For one class, comprising 60 captains, a return to the principle of permanent appointment as officers of the department.

(d) For the second class, comprising 57 captains, a reduction to one year of the time required to be served with the line before being again eligible to detail in the department.

(e) That details to the second class of captaincies may be made from either captains of first lieutenants of the line.

As the reasons for these changes are involved with those for other changes, it is thought best to simply mention them here and take up their discussion later in connection with those with which they are involved.

(8) Two hundred and fifty post quartermaster-sergeants.

This contemplates an increase of 50 in the number of post quartermaster-sergeants, the present authorized number being 200.

These officers of the post noncommissioned staff are for duty wherever there are considerable stores of quartermasters supplies to be kept and issued, whether at military posts or stations, in the field, or at the general depots and distributing offices of the department. They are to be in charge of storehouses and like places for the storage and safekeeping of public property, and responsible for the safety of the property, and orderly and cleanly arrangement and keeping of the stores.

(9) All vacancies in the grades of colonel, lieutenant-colonel, and major created or caused by this act and hereafter occurring in said grades shall be filled by promotion according to seniority, as now prescribed by law.

In so far as the remaining officers appointed and commissioned as quartermasters are concerned this provision makes no change in the existing law. In case of the requested increase being authorized, however, there would be more vacancies in the grade of major than captains of the Quartermaster's Department for promotion to majors. In that case, under the present law, the vacancies which could not be filled by promotion of captains of the department would be filled by detail of majors of the line, who would serve four years and not be again eligible to detail until after having served two years with the line. By this provision vacancies in the grade of major will be filled first by promoting captains and quartermasters now officers of the department, and second by promoting captains selected and appointed to the class contemplated to become permanent officers of the department.

(10) To fill original vacancies in the grade of captain created by this act in the Quartermaster's Department, and to fill vacancies occurring hereafter in the grade of captain through promotion of the captains to be appointed, the President is authorized by and with the consent of the Senate, to appoint officers from the army at large, from the grade in which the vacancy exists or from the grade below.

This contemplates the following changes in the present law, viz:

(a) The permanent appointment of captains as officers of the Quartermaster's Department, as referred to in (c) preceding.

(b) The selection of officers for such appointments from either captains or first lieutenants of the line, as is also contemplated for details to the second class of captains. (See (d) and (e) preceding.)

From the captains of the permanent class first appointed, vacancies not filled by promotion of the present permanent captains of the department would be filled by promotion according to existing law and the vacancies caused by these promotions in turn filled by appointment of additional captains until all vacancies in the contemplated permanent personnel are filled, when promotions would be made as vacancies occur, as now provided by law, and vacancies in the grade of captain of the permanent class filled by appointment.

(11) And officers so appointed shall rank from date of appointment.

This is an original provision made necessary by a return to the principle of permanent appointments and is designed to give officers so appointed rank according to their length of service and experience in the Quartermaster's Department, and also to base promotions upon the same grounds.

CHANGES CONTEMPLATED IN THE PRESENT LAW.

(7-a) That all the field officers of the department shall be permanently appointed.

The experience of this department with the present detail system has not been favorable to its continuance. While the officers detailed for four years' service are all believed to be capable of eventually becoming efficient quartermasters, they are as a rule without technical knowledge to make them available for many of its duties, and as a consequence are not able to at once take up and perform their work in the best and most economical manner.

The spirit in which the detailed officers enter upon their duty with the department is almost invariably highly commendable. With but few exceptions they have at once taken up and assiduously followed the study of general administrative work of the department and applied themselves to mastering the details of that duty upon which immediately engaged. Thus, during the tour for which detailed, those who apply themselves acquire a knowledge of the regulations and customs governing the department, learn its paper work, how to prepare contracts, familiarize themselves with the more important statutes and decisions relating thereto and to disbursements, and by the expiration of that period are achieving the skill of experts in construction work; the inspection of textiles, shoes and leather, or metals; the management of transportation by rail or water; the selection of animals, or other important lines of quartermaster's work. They become, within the limitations of the experience gained, excellent quartermasters and would generally prefer to remain in the department. To attain their status as quartermasters, however, they must have neglected or entirely abandoned the studies pertaining to their line duties. They have performed no active line service and become rusty in what they knew previous to entering upon their four years' detail, and realize that another period of hard work and study is ahead of them before they can even win back their former efficiency as line officers. Meanwhile they are to the line much as they were to the department upon first entering it. So in each detailed officer returning to the line after four years' duty as a quartermaster, the department has lost the benefit of his acquired experience and expertness, the line will lose service it needs while he requalifies himself for its duties, and the officer loses a hard earned standing as a quartermaster and finds himself behind his fellows of the line who have not had staff details, and so handicapped as to make catching up with them and regaining the relative standing among them he had before his detail a discouraging and seemingly hopeless task.

The more important works upon which the department is now engaged are necessarily being carried on under the direction of officers of the old force of the department, as, for instance, the important construction work at Fort Mason, Cal., West Point, operation of the

important general depots like those of New York City, Philadelphia, St. Louis, and San Francisco, supervision of the army transport service, etc. When officers of this class shall be no longer available, it is anticipated that the greatest difficulty will be experienced in selecting those qualified to handle such work.

Under the present system, when captains in the permanent corps become exhausted by promotion, selection of field officers will be necessary. By virtue of their grades, and consequent increased responsibility, they should possess to a correspondingly greater degree the technical knowledge that is so essential for efficient service by a captain and quartermaster; but the source from which officers so qualified can be drawn is not apparent.

In time of war, when the Quartermaster's Department will, more than at any other time, require officers of zeal, experience, and efficiency, it is thought the greatest difficulty will be met in obtaining this class of officers, inasmuch as those of the type required will seek duty with troops in the line, for the greater opportunity offered to distinguish themselves and obtain high command.

An officer of the Quartermaster's Department should be equipped with a thorough knowledge of office administration, a broad subject in itself, including that of chief quartermaster, depot quartermaster, and field quartermaster, as referred to in Army and Field Service Regulations, and the Quartermaster's Manual, and of the customs of the service, which only study and experience can bring. He must be equipped with a knowledge of the functions of the Quartermaster's Department with reference to the organization of troops, their shelter and supply in the field and in garrison; with their transportation by land, and the various means thereof; of transportation by water; a thorough knowledge of animals, and a knowledge of the manufacture of clothing, including, as it does, the knowledge of textiles, dyes, and methods; he should be master of questions relating to the construction of buildings, lighting, heating, and ventilation; of sanitary plumbing, and the location, development, and construction of roads, wharves, bridges, pavements, exterior lighting systems, steam engineering (both stationary and marine), and should have a technical knowledge upon numerous other subjects not hereinabove enumerated.

This wide field requires an officer to familiarize himself upon a great diversity of subjects, and in order to successfully fulfill the functions required of the department, he must give his undivided time and attention and the full limit of his mental capacity to preparing himself to perform the duties which may fall upon him. The result is that when or shortly after this has been accomplished, the detailed officer's tour of duty is at an end. It is known that many officers serving the four years' detail in the department, who have, by study and careful attention to their duty, rendered themselves efficient quartermasters, do not feel qualified to again take up their duties with the line. Their work as quartermasters has required their personal supervision and study, and they have not been able to keep up the studies pertaining to their position in the line. Their experience as quartermasters is valuable to this department, but of little use to them on return to the line. They would prefer to remain with the department, and it would prefer to have them do so.

(7-b) *A division of the authorized number of captains into two classes.*

It is believed to be now generally conceded that there are serious defects in the existing detail system and that the results of final full development according to present plans can not help being disastrous. On the other hand, there is advantage to the service in the closest possible knitting together of the supply departments and the line of the army, to the end that officers of each may be conversant with the needs and duties of the other and that both may profit by interchanges of ideas and experiences. It is believed that with the two classes of captains proposed the graver faults of the present system of detail can be avoided and the advantages of permanent appointments secured to the department, while whatever of good there is in the detail system can be retained and utilized.

The establishment of these two classes in the grade of captain would have the double advantage of giving quartermasters service with the line of the army, and captains of the line service with the Quartermaster's Department—also first lieutenants, if the provision authorizing their detail be adopted. It would, at the same time, afford a reliable and stable personnel, adequate to become expert in the technical lines of the department's work and in its more important administrative functions. The opportunities for this advantageous interchange of service could be increased by increasing the number of captains, so that there would be a sufficient number of them for assignment to all quartermaster's duties commensurate to that rank, and requiring the whole, or the greater part, of one officer's time and attention, about one-half the total number of captains to belong to the permanent and one-half to the detailed class.

(7-c) *For one class, comprising 60 captains, return to the principle of permanent appointment as officers of the department.*

(10-a) *The permanent appointment of captains as officers of the Quartermaster's Department, as referred to in (b) preceding.*

This provides a class of captains to perform certain duties peculiar to the department, wherein more professional, technical, or expert skill is required than can reasonably be expected to be possessed by detailed officers, and the advantage of which, if acquired during the period of detail, would be lost to the department upon return of the detailed officer to the line.

The captains for constructing, etc., quartermasters, for assistants at the general depots on inspection duty and supervising manufacture, for assistants in the remount service, in charge of or assistants at depots and disbursing offices, and as far as possible those for post quartermasters should be permanent officers of the department.

Under the present system, after a few more years, all captains of the permanent establishment in the Quartermaster's Department will be absorbed by promotion or casualty, and there will remain in that grade only officers detailed from the line. These will, at the expiration of their detail, return to their line duties, and knowing this must be they naturally devote a considerable portion of their time and energy to keeping up the studies pertaining to such duties to the disadvantage of those pertaining to the duties of the department in which detailed. While in theory their training and experience are still available to the Quartermaster's Department whenever

needed, in practice it is found that in the majority of cases they do not become available for detail, whether by promotion to higher grade and command, especially required in their own regiment or corps, or from other causes.

The principle of the foregoing plan was recognized as being sound by the Secretary of War in his discussion of the needs of the Quartermaster's Department, on page 41 of his annual report for 1908, where he said:

I think that the duties of the officers of the Quartermaster's Department may be divided into a general classification as follows:

- (1) Chief, depot, and purchasing quartermasters.
- (2) Constructing quartermasters.
- (3) Quartermasters of junior grade with less experience.

It is very plain that the duties of each of these groups ought to be entirely different from the other, and that the most efficient discharge of the duties of quartermasters of the first and second classes calls for a knowledge that can only be obtained by years of experience in that particular line of work.

Quartermasters of the third class, with the additional experience of years of service in the Quartermaster's Department, become the natural source of supply for making assignments in the senior classes.

For the reasons thus indicated I think that such proportion of the officers of the Quartermaster's Department as are needed regularly for construction work and for the wholesale purchase and procurement of supplies and for the positions of highest responsibility might well be permanent officers, but I see no good reason why a large part of the junior quartermasters (captains) should not be selected by detail, preferably from those officers of the line who, in the discharge of such duties in connection with service with troops as are usually performed by the regimental quartermaster or other officer detailed as post quartermaster, have shown marked ability for that kind of service.

There are single branches of the duties devolving upon this department which men in private life take up and follow as their profession and to which they devote the work of their lives, as, for instance, construction work, transportation business, the manufacture of clothing, and of shoes, and a number of other examples might be cited. Even after proper appointments have been made a quartermaster's duties can only be learned by close application and long experience; therefore, the longer an officer serves in the department the more efficient he becomes and, consequently, the more valuable to the service in general. The necessity of efficient service in this department and of affording it the fullest possible scope to secure and retain the talent most fitted for its conduct seems to me too obvious to require argument, and it is not considered that the present system is affording that opportunity.

This is, in commercial life, an age of specialization, and the detail system, as applied to this department, needs these changes to make it touch at all points.

(7-c) For the second class, comprising fifty-seven captains, a reduction to one year of the time required to be served with the line before being again eligible to detail in the department.

This provision retains 57 captaincies (only 3 less than now) to be filled by the detail of line officers for four years' service as quartermasters, thus preserving to the line of the army any advantage there may be to it in having a percentage of its officers educated in the administrative work of the Quartermaster's Department, which is the most they could be expected to attain any degree of efficiency in during that period of time.

During the four years' tour it will be found that some of this class of captains will develop special aptitude for the duties of the department, and while it may possibly be of advantage to the service generally that they should keep in touch with the duties of the line, they should be available for additional service as quartermasters before getting out of touch with the department's duties, so far as they have been learned. For this reason it is proposed to reduce to one year the time they are to be required to serve with the line before being again eligible to detail as quartermasters. Practically it will, of course, seldom occur that an officer will receive a second or succeeding detail to the department, as vacancies will not always, or perhaps generally, be available after a year and some will not develop sufficient ability, aptitude, or interest in the work of the department to be again desirable, although they may make efficient officers in other branches of the service.

From among those of this class of captains who develop the best ability for a quartermaster's duties, and who take the most interest in the department's work, will be made selections, based upon suitable examinations and consideration of efficiency of service, for appointment to the first class of captains, from which promotions to the grade of major will be made.

(10-b) *The selection of officers for such (permanent) appointments from either captains or first lieutenants of the line. * * **

(7-e) *That details to the second class of captaincies be made from either captains or first lieutenants of the line.*

The object is to extend the field from which selections of quartermasters may be made, and to encourage the younger officers who have an aptitude for any branch of the department's work to fit themselves for duty in the department. It would be advantageous to select officers for the technical branches of the department's duties, such as the inspection of supplies, the construction of important buildings, water systems, electric-lighting plants, etc., from among the younger officers found to have a bent for one of these classes of work, or having already some education or experience in one of them. They could then study and develop themselves under the direction of officers of more experience, and in time come to be experts upon whom reliance could be placed. Where experience in administrative matters would be of first importance, as for assistants to chief quartermasters, quartermasters on vessels of the army transport service, etc., older officers of longer service would be preferable.

Following are the recommendations heretofore made on this point, viz:

* * * That the law be so modified as to allow also the detail of first lieutenants of the line, they to have the rank and pay of captains mounted, while so serving; * * * (Quartermaster-General's Annual Report for 1904, p. 31.)

* * * In the second class of captaincies, in addition to the detail of captains of the line, the law should authorize the detail of first lieutenants of the line, to have the rank and pay of captains mounted, while serving as quartermasters by detail. * * * (Quartermaster-General's Annual Report for 1905, p. 59.)

* * * "Authority to detail first lieutenants of the line as acting quartermasters, with the rank and pay of captains mounted while so serving, was advocated." These were all provisions which long experience and careful study have convinced me were needed in the interests of the public service, and all reasons given therefor hold good to-day, experience of the past twelve months having only strengthened the opinions held and the reasons given a year ago. * * * (Quartermaster-General's Annual Report for 1906, p. 48.)

In his annual report for 1906 the Quartermaster-General renewed recommendations previously made for an increase of the corps, both in commissioned officers and in post quartermaster sergeants. Attention is invited to the discussion of these subjects in the annual reports for 1904, 1905, and 1906, which are yet pertinent, and which, in fact, are accentuated and the views expressed confirmed by the observation and experience of another year. (Quartermaster-General's Annual Report for 1907, p. 49.)

* * * Details should be made from captains or first lieutenants of the line, the latter to have the rank and pay of captains while serving in the department. * * * (Quartermaster-General's Annual Report for 1908, p. 55.)

SEC. 2. That details to the Quartermaster's Department * * * may be made from the army at large from the grade in which the vacancy exists, or from the grade below. (Quartermaster-General's Annual Report for 1908, p. 57.)

All vacancies in the grade of captain in excess of those to be filled by detail shall be filled by permanent appointment from the army at large from the grade of captain or first lieutenant. * * * (Quartermaster-General's Annual Report for 1908, p. 57.)

REASONS FOR INCREASE.

The request for an increase in the number of officers for the Quartermaster's Department is based upon the following grounds, viz:

(a) Increase in the authorized strength of the army without a proportionate increase in the number of officers of the Quartermaster's Department.

(b) Increase in the duties to be performed by the department, in addition to those incident to the increase of the army.

(c) Expansion of the territory within which the operations of the department must be conducted.

(d) Increase in the amount of funds to be disbursed by officers of the department.

(a) Increase in the authorized strength of the army without a proportionate increase in the number of officers of the Quartermaster's Department.

By the Army Register for 1898, which is dated December 1, 1897, the strength of the army is given as, commissioned, 2,164; enlisted, 25,000; and Hospital Corps, 725; a total of 27,889. Fifty-seven officers of the Quartermaster's Department were provided for the service of this force, or one officer for each 489 of the total strength of the army.

By existing laws the strength of the army is, commissioned, 4,551; enlisted, may be, 100,000, should the President so direct; Hospital Corps, 3,500; a possible total of 108,051. Ninety-six officers of the Quartermaster's Department are provided for this force, or one officer for each 1,125 of the total possible strength of the army. Had quartermasters been provided for the above total in the same ratio as for the strength prior to the increase, the authorized number would have been about 220.

The authorized strength of the army on July 20, 1909 (Army List and Directory, p. 7), was, commissioned, 4,551; enlisted, 84,519; Hospital Corps, 3,500; a total of 92,570. The 96 officers of the Quartermaster's Department are one for each 964 of this number. Had quartermasters been provided in the ratio prior to increase of the army, the number would have been 189.

While it is provided by law that the Hospital Corps (enlisted men of the Medical Department) is not to be counted as a part of the strength of the army, this department must do for them all it does for enlisted men of the army; hence, they have been counted in the foregoing

totals. The commissioned strength has also been counted because, considering that officers must be furnished quarters, fuel, light, furniture, mounts, if required, forage, shoeing, etc., for their authorized horses, transportation in many cases, have their baggage allowances crated and transported, and horses transported on change of station, sold certain supplies, etc., they entail about as much labor on this department as a like number of enlisted men.

The force of the claim that the increase in the Quartermaster's Department was not in proportion to the increase of the army was recognized by the Secretary of War in his annual report for 1908, page 40, in the following language:

I think there can be no question that the legislation providing for the increase of the army in 1901 fell short of making adequate provision for the Quartermaster's Department in view of the magnitude of its duties and the wide field of its operations.

The increase of the army to two and one-half times its former size necessitated a very large amount of new construction work at army posts in addition to the very considerable work of this character which is always going on incident to the maintenance of old posts, and the increase in the Artillery Corps, provided by the act of January 25, 1907, will cause an additional amount of construction work for a long time to come. As has been pointed out above, this construction work is of an unusually extensive character, involving not only the construction of modern buildings with their intricate improvements and installations of plumbing, heating apparatus, and lighting fixtures, but also water supply and sewer systems, pumping, ice manufacturing and lighting plants, roads, walks, bridges, wharves, and sea walls. Another important duty of the Quartermaster's Department, the furnishing of clothing and other supplies for the army, was also greatly enlarged by the increase of the army. The procurement of these supplies involves wide and thorough knowledge of textiles, leathers, and dyes, and the processes of manufacture of clothing, hats, shoes, etc., including as it does the knowledge of the various materials and methods which enter into the manufacture of these supplies.

(b) Increase in the duties to be performed by the department, in addition to those incident to the increase of the army.

Few new duties or responsibilities have been created by law, but modern developments have noticeably extended and broadened the scope of the department's work.

One major of the department is detailed on the General Staff, operating to reduce the strength of the department to that extent.

The transport service is entirely in addition to any duties of the department on January 1, 1898. For the efficient administration of this service it is estimated that a portion of the time of three officers—the depot quartermasters at San Francisco and New York City as general superintendents and the quartermaster at Seattle—and the entire time of 21 officers as their assistants or in active charge of the vessels while on voyages are required.

Two cable ships for signal corps work are new service since 1898 and should be provided with quartermasters to be responsible for their navigating equipment, employment and discharge of crews, disbursement of quartermasters funds, and be responsible for proper supply of the vessel with deck and engine supplies which are furnished by the Quartermaster's Department.

The 8 mine planters for the coast artillery service and a number of auxiliary launches and small boats are new, have been built, and must be furnished with crews, deck and engine supplies, and repaired by this department.

The department owned and operated 11 steamboats in 1898, before the war with Spain and the later developments of the coast-defense

projects. It now owns and operates the 17 ocean-going passenger and freight steamers and one ocean-going tug of the army transport service; one 102-foot ferry steamer; 21 harbor steamers, ranging in length from 85 to 130 feet; six 65-foot wooden tugs; 22 tugs and steamers, ranging in length from 85 to 100 feet; three steam lighters, ranging in length from 106 to 142 feet; 96 launches, ranging in length from 30 to 100 feet, with steam, gasoline, or electric power, and two cable steamers for signal corps uses; and it has built the four 150-foot and four 165-foot mine planters and the 33 gasoline or electric power junction-box launches of the Artillery Corps for use in seacoast defense work—a total of 200 vessels. In addition to the foregoing, one 114-foot steel ferry steamer and three 120-foot steel harbor steamers will be completed and in commission early next calendar year. Except crews for the junction-box launches, the Quartermaster's Department furnishes crews, deck and engine supplies for all the above vessels, makes all repairs required by them, and pays most of the incidental expenses of their operation.

The water supply and distributing systems at military posts have been greatly extended and improved during the period in question, involving the purchase of large quantities of fuel and engine supplies, the installation, care, and repair of plumbing in buildings, and the hire and supervision of skilled mechanics and laborers to operate and keep these systems in repair.

On January 1, 1898, no posts appear to have been lighted by electricity. Now 80 garrisoned posts are so lighted, three new systems, for which current will be purchased, are in course of construction, and several systems already installed are being extended. At 55 garrisoned posts the Quartermaster's Department now purchases the current from commercial producers and at 17 from power plants installed by the Engineer Corps, but provides the system for lighting, and at 8 the department has installed and operates lighting plants. These systems must be kept in repair and fuel and supplies purchased and employees hired and supervised in the operation and care of the valuable machinery of the lighting plants operated.

Many new posts have been built since 1898, and the old ones have been extended, remodeled, or rebuilt, and they require infinitely more care than the posts in existence prior to that time, most of which falls upon this department.

The department now supplies and cares for heavy furniture in officers' quarters, a new duty; issues fuel and light to officers instead of making sales; supplies the mounts for officers below the grade of major required to be mounted not providing their own and cares for them; packs and crates change of station allowances of baggage; transports to their homes for interment the remains of officers and enlisted men who die in line of duty and of civilian employees who die abroad, if so requested. All these are new duties involving labor not incident to the increase of the army.

The military maneuvers of recent years are entirely different from anything of the kind ever undertaken prior to 1898, and the preparation for them, their conduct, and the winding up of business connected with them after their completion make a great deal of extra work for the Quartermaster's Department.

The issue and sale of supplies to the organized militia was only in its incipience in 1898, the policy established by section 1661, Revised

Statutes, having been broadened and stimulated by the act of July 1, 1897. The total issues and sales for the fiscal year 1898 amounted to \$210,481.62, while for 1909 they amounted to \$1,007,732.01. A great deal of work is involved in the purchase, issue, shipment, transfer of funds, etc., connected with this duty, and it has increased five-fold in volume, as shown by the above figures.

The work of this department in the handling of transportation for other executive departments, as required by the act of July 5, 1884 (23 Stat. L., 110), has greatly increased. The value of this service on bills of lading for the fiscal year 1898 was \$38,128.33, exclusive of service on the bond-aided railways. For the fiscal year 1909 the money value of this service is not known, as the work of handling the accounts in this office became so great it was impossible to continue it, and arrangements were made whereby quartermasters settling transportation accounts should state these accounts and send them direct to the interested department for settlement. This takes away from this office data as to the quantities transported or the money value of the service. A careful consideration of the work of the Washington, D. C., depot shows that about 24 per cent of the transportation accounts handled and 47 per cent of the bills of lading issued were on account of shipments for the other executive departments. Lack of time has prevented compiling exact data for other depots and important transportation offices of the department, but they all furnish a great deal of this class of service, and it is clear that a considerable portion of the time of shipping quartermasters and their office forces is required to attend to it. On the army transports passengers and freight entitled to transportation at public expense were carried for other departments and the Philippine government, which, had public commercial rates been charged, would have cost for transportation charges \$530,207.

INSPECTION OF THE PURCHASE AND MANUFACTURE OF SUPPLIES AND SUPERVISION OF CONSTRUCTION.

The army reorganization act of February 2, 1901, had not been in force long before it developed that the personnel of this department established thereby was not numerically strong enough to do the department's work, nor did the system of detailing officers for duty in the department generally provide those of sufficient experience and skill to superintend these branches of the work to the greatest advantage. In his annual report for 1906 the Quartermaster-General referred to this development, saying:

There is no question that this department begins to feel the need in certain of its operations of officers of more experience and special training than can be expected under these temporary details. This is especially true with reference to inspection and purchase of supplies, particularly clothing and equipage, animals, and the superintendence of construction.

Again, in the annual report for 1907 representations were made of the—

urgent need for officers specially trained in the construction of buildings; of water, sewer, and electric-lighting systems; the installation of modern heating apparatus; in textiles and leather; and the processes of manufacture of clothing, hats, shoes, etc.; also in details of transportation by land and water.

And it was asserted that—

the supervision of the work by trained officers is a material saving to the United States, and, moreover, the results obtained are far more satisfactory.

For want of properly qualified officers for this expert and technical class of work the department was compelled to rely upon civilian employees. Unfortunately, these were not always as capable or reliable as they should be, and the results of this enforced reliance were disagreeable and uneconomical. There developed considerable adverse criticism, both of the quality of supplies furnished by the Quartermaster's Department and of the methods and reliability of inspections of supplies purchased, or manufactured under contract, most of which originated in requests of this office for an authoritative investigation of some alleged faults. This office early knew of and realized that improvement was needed in these matters, and as a means to that end the Quartermaster-General in his annual report for 1904 urged that existing laws be so modified as to allow officers of the department to be ordered to make necessary journeys in connection with the work of the department, their actual expenses while on such duty to be paid from the appropriation to which the travel pertained. The reason advanced for recommending this change was that it—

would enable a closer inspection to be made of important construction work and the manufacture of supplies of various kinds by rendering more elastic the details of officers, and would relieve the mileage appropriation of the Pay Department from the charge of such work, placing it where considered to properly belong—against the immediate object for which expended. Under existing laws and decisions this is not possible.

In the Quartermaster-General's Annual Report for 1905 the foregoing recommendation was repeated and an increase of the commissioned personnel also urged. Both recommendations were repeated each year thereafter and arguments in favor thereof submitted until 1908, when the recommendation for payment of traveling expenses was dropped and representations confined to the need for an increase in the number of quartermasters. The omission of the recommendation that traveling expenses be paid officers of the department when inspecting purchases, the manufacture of supplies under contract, or construction work in progress should not be construed as admitting the principle to be unsound, nor as repudiating the arguments in favor of the plan. It was dropped because it seemed impossible to secure serious consideration of the plan on its merits and because the need for more officers had become so urgent as to seriously threaten the efficiency of the department, and therefore paramount.

In the meantime the adverse criticisms above referred to had come to the attention of the Secretary of War, who under date of October 6, 1905, issued certain orders concerning purchases, inspections, etc., which were promulgated in General Orders, No. 167, War Department, 1905, of which the following is an excerpt, viz:

6. *Raw materials* used by manufacturers in furnishing finished products will be as frequently inspected as the interests of the Government may require by inspectors especially qualified for such work, subject to frequent *personal* supervision by a commissioned officer.

7. All supplies furnished under contract or otherwise will be subjected, whenever practicable, to the personal inspection of a commissioned officer at the time of delivery; otherwise such inspections will be made by civilian inspectors under his personal supervision, subject to test and verification at irregular intervals and at unexpected times by such officer.

8. Commissioned officers charged with such inspections and with the supervision of civilian inspectors must qualify themselves by study, observation, and practice for such supervision as shall effectively protect the government interest.

The issuance of this order was explained by the Secretary of War in his annual report for 1905, as follows:

Complaints have been received at the department from time to time concerning the quality of clothing and other supplies furnished to the army by the Quartermaster's Department. * * * For some time past, by my direction, the Assistant Secretary of War has been conducting an exhaustive examination of the different clothing depots of the Quartermaster's Department, including a thorough study of * * * matters incident to the * * * manufacture, receipt, inspection, and distribution of quartermaster's supplies.

* * * * *
For the purpose of further safeguarding the interests of the Government in the procurement of the supplies required for the several branches of the military establishment, orders were issued by me on October 6, 1905, intended to produce a * * * more rigid inspection of supplies furnished in performance of a contract. * * *

In connection with the foregoing, other instructions were from time to time given this office, of which the following are the more important, viz:

Under date of August 21, 1905, after an inspection of the Philadelphia general depot of the Quartermaster's Department, the inspecting officer made, among others, the following recommendation, viz:

Ninth. That the commanding officer, or his assistant, be constantly about the inspection room while goods are being received and inspected, this duty being of paramount importance.

This the Acting Secretary of War approved September 7, 1905, and directed that—

In the future * * * at all such depots * * * a commissioned officer shall personally and continually supervise the inspection of all articles tendered under contract with a view to their acceptance, availing himself of the knowledge of the chief inspector as an expert.

On the same date he directed, with reference to the force in this office, that—

* * * The duties incident to the office in question (civilian chief inspector of supplies and textile fabrics) will be performed by a commissioned officer of your department, who shall qualify himself as soon as possible for the work, this being in accordance with the policy which has been decided upon of substituting commissioned officers for civilian chief inspectors when practicable.

Subsequent to the orders of the Secretary, referred to above, additional instructions in the matter were given this office, as follows:

* * * The system must be put into practice of placing intelligent and capable commissioned officers at the factories where large contracts are being filled, such officers to take the place gradually of the civilian inspectors, who must be done away with as soon as practicable.

* * * * *
The Quartermaster-General is requested to bear in mind that the policy of the department is positively decided as far as the substitution of commissioned officers for civilians in the higher positions of inspection of all army supplies. (Acting Secretary of War, Nov. 2, 1905.)

* * * The following scheme of inspection will be instituted by the Quartermaster's Department and put into operation at the earliest practicable moment:

Wherever there is a large and important contract for some specified article, such as shoes or hats, commissioned officers should be stationed at the factory and may be aided by an expert and the necessary number of assistants having a trade knowledge of the articles being delivered. The inspection should cover the raw material, the process of manufacture and the finished product. The officer should finally inspect at the factory and pass upon the articles to be delivered under the contract. * * *

In cases where the above-prescribed plan is impracticable, by reason of the varieties or limited quantities of the supplies, the inspection at the factory should be eliminated, and in lieu thereof the articles should be delivered for acceptance at the supply

depot and be examined by assistants under the direct supervision of an expert inspector. These examiners should be men of practical trade knowledge of the articles they are required to inspect, while the expert inspector under whom they work should have such breadth of knowledge as to make his supervision highly efficient.

* * * A commissioned officer should devote his entire time to the careful supervision of this work, and it should be his object to gain the fullest possible expert knowledge to qualify himself as an expert inspector of such goods.

* * * Expert inspectors should be hired in sufficient numbers to meet the needs of the inspection service; while commissioned officers assigned to this line of work should avail themselves of every opportunity to qualify for these duties. (Assistant Secretary of War, Nov. 28, 1905.)

Efforts were made to comply with these instructions, all of which were sound in theory, and would have produced most excellent results in practical operation. The department, however, did not have enough officers to do the work contemplated to be done by officers, nor were there many officers who had the technical knowledge required for these duties. Little help could be drawn from officers of the line of the army, as the depletion of commands through detailing of officers on duties away from their commands had already provoked earnest and well-grounded protests from commanding officers.

As the matter now stands, therefore, this office has been instructed to carry out a policy of undoubted advantage to the service, but has not been furnished officers to do the work involved. The captains estimated for as assistants at the depots are needed for this duty. This policy contemplates that officers making or supervising these inspections be, or proceed to become, experts. There is nothing in the education or training of officers for the line of the army, or in the experience gained in service therewith to give them the expert knowledge required for this inspection work, so that nothing could be expected from that source, and it would require more years of study and experience than the four years' tour provides for an officer to render himself sufficiently expert to become an inspector of most classes of quartermaster's supplies. If, then, an officer who is on this duty has to return for a period of service with the line after four years, his knowledge and experience are lost to the service, because they have no place among his line duties. The possibilities of the department securing him for another four years after he completes his service with the line, or as a field officer at some future time, are extremely remote. In the meantime another officer is starting anew, and the service loses the benefit of his predecessor's study and experience. These are the grounds upon which it has been insistently held that the captains for this duty should be permanent officers.

Construction matters are in a very similar status, except that the responsibilities of the department, while fully realized by this office, have not been the subject of so explicit instructions as have the purchase and inspection of supplies. One of the objects of the Quartermaster-General in seeking authority to pay actual traveling expenses to quartermasters on inspection journeys was to secure a closer supervision of construction projects by officers of knowledge and experience, who could impart instructions to the younger and less experienced officers in immediate charge, who in many, if not most, instances had very little, if any, training to especially fit them to superintend the construction of buildings, water, sewer, lighting and heating systems, road, bridge, and sea-wall building, grading, drainage, and like work. Usually these young officers in charge of construction projects were

energetic and apt, and were acquiring a knowledge and experience of possible future value to the service, provided it should become possible in the operations of the detail system to ever again secure them for like duties. But their knowledge and experience were being procured at a maximum of risk and expense to the Government, and the possibility that any one of them could be secured for like future service is shadowy.

It was this state of affairs that my predecessor had in mind when, in his annual report for 1905, he said:

We are doing construction work to the extent of millions of dollars, under the various appropriations pertaining thereto, and the officers in charge are not always as thoroughly qualified as they should be. This can not be corrected at once, if, in fact, it ever can be under the present system of details for service in a department where special knowledge and experience is important in the essential branches of its work. Our superintendents of construction, who come to us through the civil service, are men of sufficient general and technical education to pass the examination, but many of them lack experience and the practical knowledge of materials and proper handling of details of construction. Therefore the probability of inferior work being done makes necessary constant inspections at the various posts by an officer of the department who is thoroughly conversant with those matters.

Work is going on at posts where we are spending hundreds of thousands of dollars, with nobody to properly supervise it from this point. I can not, to the extent advisable, send out our experienced officers, because largely of lack of funds for mileage, there not being sufficient to meet the general wants of the service. If the Quartermaster-General had authority, subject to the approval of the Secretary of War, to send an officer to a desired point, and he could be paid his actual traveling expenses, as indicated, it would open a way for the proper and efficient supervision of matters of construction, purchase of horses, manufacture of clothing and equipage, or any other of the manifold duties the department is constantly being called upon to perform, and enable me to have each project inspected by some officer who, from experience and study, had become expert upon the matter in hand. As a matter of fact there ought for the past year to have been, and ought now to be, at least one officer thoroughly competent in that line, traveling all the time, looking after construction, while frequent inspections along other lines are badly needed.

Similar representations were made in succeeding annual reports, and the fact that no relief had been afforded or was in prospect under existing conditions impelled me to submit further explanations of the department's needs in this respect in my annual report for 1908, which are still pertinent, and were as follows:

It is obvious that certain qualifications are required of a quartermaster in charge of construction work not possessed by all officers of the Quartermaster's Department, or other branches of the service. * * *

Construction work at military posts and stations has been, and still is, so extensive and important, and covers so extended a period, that post quartermasters are frequently not qualified to supervise it, and those who are usually have not the time to devote to it in addition to their regular duties, while their being subject to frequent changes of station renders any continuity of policy impracticable, and can only result in hopeless confusion should an attempt be made to place them in charge of this work generally. * * *

* * * Because of the insufficient number of officers in the Quartermaster's Department the supervision of important and intricate construction work in progress and contemplated at a number of posts must necessarily be intrusted to young subordinate officers without previous experience and training. Then there is the additional disadvantage, that at all places where these young officers are in charge of construction pertaining to the Quartermaster's Department they are required to perform a part of their regular garrison duties and are in most cases also charged with the labor and responsibility of post or artillery district quartermasters, or other staff duties under the direction of their post commanders. But a greater drawback than all these to a satisfactory supervision of intricate construction work, such as is required for modern buildings and improvements involving not only construction of buildings, but also of wharves, sea walls, water supply and sewer systems, pumping, ice manufacturing and lighting plants, roads, walks, etc., is the fact that these line officers are

subject to changes of station incident to their military duties and status, over which changes the Quartermaster-General has no control, because in their assignment their duties and services as line officers are first considered, and the supervision of construction work falling to their position is only an incident.

* * * At several posts there have been three changes of quartermasters in charge of construction within a period of a year, and two changes in a year are very frequent.

Under such conditions it is impossible for any officer, however able and willing, to give to the supervision of important and intricate construction work the time and attention that is necessary.

Not only are more officers needed for the duties above outlined but they must have special qualifications if the duties are to be efficiently performed.

This office has consistently held, and still maintains, that technical knowledge of a high order is necessary to a proper performance of many branches of the department's work, and particularly in the inspection of purchases, the manufacture of supplies, and supervision of construction.

Probably no better presentation of this feature can be made than to reproduce here excerpts from previous reports, etc., bearing on this point.

This office can not concur with the view that technical knowledge is not required of officers to be detailed to the Quartermaster's Department, * * *. On the contrary, technical knowledge of a high order is a necessary qualification in nearly every branch of the department's work, * * *. The want of officers having technical knowledge in certain branches of the work of the Quartermaster's Department is believed to be the weakest point in its personnel, * * *. The views of this office on the necessity for technical and expert knowledge on the part of officers have been heretofore officially expressed, especially in annual reports of the Quartermaster-General for 1904 and 1905 * * *. (Quartermaster-General in memorandum to Chief of Staff dated May 1, 1908.)

The duties of a quartermaster are of such a nature and so great a scope as to constitute a profession in themselves, and, even after proper appointments have been made, can only be learned by close application and long experience * * *. (Quartermaster-General's Annual Report, 1904, p. 31.)

* * * There are single branches of the duties devolving upon this department which men [in private life] take up and follow as their profession and to which they devote the work of their lives, as, for instance, construction work; a number of other examples might be cited. (Ibid. 1905, pp. 59, 60.)

* * * In a business way, it [the Quartermaster's Department] is in constant contact with manufacturers of cloth, clothing, shoes, wagons, machinery, heating and lighting apparatus, railroad and water transportation companies, shipbuilders, dealers in horses and mules, and forage, contractors for building, and manufacturers and dealers in all supplies relating to building, water and plumbing systems, grading, etc., the enumeration of which would require pages. (Ibid., 1907, p. 3.)

* * * There is, however, an urgent need for officers specially trained in the construction of buildings, of water, sewer, and electric lighting systems, the installation of modern heating apparatus; in textiles and leather, and the processes of manufacture of clothing, hats, shoes, etc.; also in the details of transportation by land and water. (Ibid., pp. 50, 51.)

* * * More captains are needed as assistants at the general depots of the department for inspection of supplies purchased and being manufactured under contract. They should be permanent officers of the department, willing and able to take up the study of the manufacture of textiles, clothing, leather, shoes, metals, etc., and follow it until they become experts. (Ibid., 1908, p. 49.)

* * * To qualify as an inspector [of shoes] an officer will require a course of training, beginning with the raw hides, following them through the tannery and all the succeeding processes to the finished product, and proficiency can only be acquired after much study and considerable experience. (Quartermaster-General to Acting Secretary of War, Nov. 27, 1905.)

* * * Efficiency in handling horses is only gained through long experience and careful study, * * *. The officers in charge of these [remount] depots should be of ripe experience, good judgment, and expert horsemen. The captains selected for their assistants should be of good judgment, sufficient experience to assist in and have temporary charge of the work when necessary, * * *. (Quartermaster-General's Annual Report, 1908, p. 50.)

* * * An officer of the Quartermaster's Department should be equipped with a thorough knowledge of office administration, a broad subject in itself, including that of chief quartermaster, depot quartermaster, and field quartermaster, as referred to in Army and Field Service Regulations, Quartermaster's Manual, and of the customs of the service, which only study and experience can bring. He must be equipped with a knowledge of the functions of the Quartermaster's Department with reference to the organization of troops, their shelter, and supply in the field and in garrison; with their transportation by land and the various means thereof; of transportation by water; a thorough knowledge of animals, and a knowledge of the manufacture of clothing, including as it does the knowledge of textiles and dyes and methods; he should be master of questions relating to the construction of buildings, lighting, heating, and ventilation; of sanitary plumbing and the location, development, and construction of systems of water supply and sewerage; of the construction of roads, wharves, bridges, pavements, exterior lighting systems, steam engineering (both stationary and marine), and should have a technical knowledge upon numerous other subjects not hereinabove enumerated. (Quartermaster-General's Annual Report, 1908, p. 56.)

It could not, of course, be expected that all officers of the department's permanent personnel even could become experts in each of the technical branches of its work, but were there enough of the permanent officers, so that certain of them could devote their time and energy to that technical work for which they had a predilection or developed an aptitude, those could become experts in the chosen branches. The department could then not only make effective the instructions it has received but it would have a force capable of developing and perfecting methods, improving supplies, revising specifications, and generally advancing the service with efficiency and in ways that are now known to be desirable but impossible of accomplishment, because there are not enough officers to do the work were they ever so well qualified, and very few technically qualified; and this because they are compelled to devote their time and energy almost exclusively to the administrative duties, impossible to be performed by other than officers. That an officer detailed for four years as a quartermaster could, during that period alone, acquire the desired expertness, in any technical line of the department's work, is not considered to be possible.

In every annual report of the Quartermaster-General from that of 1905, representations along the foregoing lines have been submitted, upon which no action has been taken. Meanwhile the difficulties and embarrassments of the department have been increasing, until the point has been reached where relief must either be afforded or the department, and incidentally the entire military service, will suffer because there are not enough quartermasters, and quartermasters of proper qualifications and experience to do the work effectively.

As showing how long realized and deep seated is this need the following remarks by my predecessor, made under date of June 15, 1907, in transmitting a transcript of records concerning reports of certain inspections to the Secretary of War, are instructive:

In connection with the supervision of inspections by commissioned officers it is desired to here state that * * * almost from the time of assuming duty as Quartermaster-General I felt that there were matters at the depots, and in connection with construction, etc., which needed to be more closely looked after by competent commissioned officers, and endeavored to secure the assistance of additional officers to enable closer inspections and supervisions to be made, but found it impossible to do so.

Similar views were expressed by me in a memorandum to the Chief of Staff, dated May 1, 1908, as follows:

* * * The want of officers having technical knowledge in certain branches of the work of the department is believed to be the weakest point in its personnel, and one which is being aggravated by the detail system each time an experienced and trained

officer of the department is replaced by one detailed, with but four years to serve, and who in all probability brings from his experience with the line but a rudimentary knowledge of any one of the widely varying duties of the department.

The only modifications the experience gained during the intervening time have suggested are such as would strongly emphasize the above expression.

In a memorandum for the Assistant Secretary of War, dated May 19, 1906, the Secretary of War said:

"What I am sure of is that the policy recommended by the Quartermaster-General of securing good inspectors by assigning the officers of the department to act in particular cases, is an excellent suggestion. I think that they ought to take courses of instruction with respect to different fabrics in order that they may possess themselves with the requisite knowledge to act themselves as inspectors and acquire practical skill in doing so. It is impossible for the department to pay the salaries needed to secure honesty and competency in civilian inspectors."

(c) *Expansion of the territory within which the operations of the department must be conducted.*

The extent of territory within which operations must be conducted and duties of the Quartermaster's Department performed is obviously an important factor in determining the amount of work involved in its administration.

On December 31, 1897 (Army Register, 1898), practically all the army was stationed in the United States, the only exception being a small garrison at Fort St. Michael, Alaska. There are now six garrisoned posts in that territory, among which are stationed headquarters and one regiment of infantry, and one company of the Signal Corps is distributed among about 50 telegraph stations. The military cable and telegraph system established by the Signal Corps requires from this department services in the transportation of supplies generally both to Alaska and along its lines, which comprise 2,524 miles of submarine cable, 1,403 miles of land lines, and 107 miles of wireless, a total of 4,034 miles. The severe cold of the region requires special clothing for the troops, types of building suited to the climate, and the short time navigation is open necessitates unusual promptness in placing supplies at destinations in larger quantities than is usual in the States.

There was no military occupation of the Hawaiian Islands on December 31, 1897, they being attached to the Department of California on July 13, 1898 (see General Orders, No. 95, Adjutant-General's Office, 1898). A battalion of artillery was ordered to take station at Honolulu by General Orders, No. 50, Headquarters of the Army, March 17, 1899, and this seems to have been the first garrison in the islands. There are now one infantry, one cavalry, and two artillery posts in the vicinity of Honolulu, garrisoned by 8 troops of cavalry, 2 companies of coast artillery, 4 companies of infantry, and 1 company of engineers. The infantry post is practically completed, but the cavalry is quartered in a cantonment and a permanent post will have to be built for that garrison, and, as now contemplated, one post for the garrison of the two artillery posts.

The Canal Zone is additional territory acquired not only since 1898, but since the reorganization of the army under the act of February 2, 1901. While the army has no garrison in the Zone, one major of the department has been assigned to duty there, in effect thereby reducing the number of officers of the department. A considerable use has also been made of the services of officers of the department

in purchasing and shipping supplies and material, etc., taking part of their time from the regular duties. This was in the general interest of the federal service and is referred to here only as indicating the range of duties and increase of work falling upon the department.

The Philippine Islands have been added since January 1, 1898, and conditions there require more officers of the Quartermaster's Department in proportion to the number of troops for efficient service than are necessary in the United States. The transportation of troops and supplies among the innumerable islands compels the use of an exceptionally large number of vessels. While the railway facilities have been greatly developed, the wagon and pack equipment must yet be unusually large and is subject to excessive deterioration, due to the practically entire absence of roads and the effect of the tropical climate. The islands afford little in the way of quartermaster's supplies, practically all of which (even most of the forage) must be shipped from the United States to Manila and from there distributed to the widely separated stations. This is largely true of all military supplies, and the Quartermaster's Department must furnish transportation for them. Sanitary problems are complicated and vexatious. Contamination of water supply is so general that an unusual number of distilling plants and sterilizing apparatus are required, and the climate necessitates the operation of a great many cold-storage and ice machines. Building operations are difficult and expensive and much of the material must be brought from the United States. The deterioration of wooden buildings is great, due to climatic conditions and local influences, so that repairs and reconstruction work are heavy.

(d) Increase in the amount of funds to be disbursed by the officers of the department.

In effect this reason includes all the foregoing reasons, but it gives a more general grasp and graphic exhibit of the volume of business and incident duties that have devolved upon the department from the sources already discussed.

For the fiscal year 1898, not considering appropriations for the conduct of the Spanish war, there was appropriated for the regular service of the Quartermaster's Department \$7,711,367.75; for the fiscal year 1897, \$8,162,938; for the fiscal year 1896, \$7,093,880. Comparing with more recent fiscal years, the appropriations for 1908 were \$35,816,277.81; for 1909, \$39,621,972.51; for 1910, \$40,332,750.16, and the estimates for 1911, from which have been eliminated every charge considered possible to be avoided or deferred without seriously impairing the military service, amount to \$37,932,895.37. The expenditures now average a little over five times what they were before the enlargement of the army and the introduction of the other factors which have increased the work and responsibilities of the department. To meet the fivefold increase of work and responsibility, the number of officers in the department was increased from 57 to 96, or one officer more than one and two-thirds times the number of officers when the work was one-fifth what it now is. In other words, while the appropriations show the volume of work to have increased about 447 per cent the number of officers to do that work has been increased only 68.42 per cent, the difference in the percentage of increase of volume of work over number of quartermasters being 378.58.

STATIONS AND DUTIES OF QUARTERMASTERS IN TIME OF PEACE.

In the Quartermaster-General's annual report for 1908 the necessity of more officers for the Quartermaster's Department was discussed and a table published showing generally the duties contemplated for the number of officers of the different grades believed to be required. Further study of the problem during the year past has slightly modified the arrangement then contemplated, and the following is now submitted as showing generally the station and duties of the number of officers of the different grades required to properly and efficiently perform the duties of the department in time of peace, viz:

Duties of officers of the Quartermaster's Department in time of peace under needed increase.

Duty.	Rank.					Total.
	Brigadier-general.	Colonel.	Lieutenant-colonel.	Major.	Captain.	
Quartermaster-General's office.....	1	2	2	5	2	12
General Staff.....				1		1
Chief quartermaster's offices:						
Department of California.....		1			1	2
Department of the Colorado.....			1		1	2
Department of the Columbia.....			1		1	2
Department of Dakota.....			1		1	2
Department of the East.....		1			2	3
Department of the Gulf.....			1		1	2
Department of the Lakes.....			1		1	2
Department of the Missouri.....		1			1	2
Department of Texas.....			1		1	2
Philippines Division.....		1			2	3
Department of Luzon.....			1		1	2
Department of Mindanao.....			1		1	2
Department of the Visayas.....			1		1	2
General depots:						
New York (also general superintendent, army transport service).....		1		1	5	7
Philadelphia.....		1		1	5	7
Jeffersonville.....		1		1	5	7
San Francisco (also general superintendent, army transport service).....		1		1	4	6
Manila, P. I.....			1		2	3
St. Louis.....			1	1	4	6
Washington, D. C.....			1		1	2
Boston.....			1	1	4	6
Depot and purchasing and distributing offices:						
Honolulu.....					1	1
Pittsburg.....					1	1
New Orleans.....					1	1
Nagasaki, Japan.....					1	1
Seattle (also in charge army transport service).....			1		1	2
Omaha.....				1		1
Chicago.....			1			1
Portland, Oreg.....					1	1
5 recruiting depots.....					5	5
Remount service, in general charge.....			1			1
4 remount depots.....				4	4	8
Purchasing animals.....				4		4
Post quartermasters:						
Camp Keithley, P. I.....				1		1
Fort Wm. McKinley, P. I.....					1	1
Presidio of San Francisco, Cal.....					1	1
Fort Riley, Kans.....				1	1	2
Fort Sam Houston, Tex.....				1	1	2
Fort Leavenworth, Kans.....				1	2	3
Fort Sheridan, Ill.....					1	1
Fort D. A. Russell, Wyo.....				1	1	2
Fort Monroe, Va.....				1	1	2
Fort Ethan Allen, Vt.....					1	1
Fort George Wright, Wash.....					1	1
Fort Snelling, Minn.....					1	1
Presidio of Monterey, Cal.....					1	1
Vancouver Barracks, Wash.....					1	1
Military Academy, West Point, N. Y.....				1	1	2

Duties of officers of the Quartermaster's Department in time of peace under needed increase—Continued.

Duty.	Rank.					Total.
	Brigadier-general.	Colonel.	Lieutenant-colonel.	Major.	Captain.	
Army transport service:						
Manila, P. I.				1	2	3
San Francisco (assistant to general superintendent, army transport service).....				1		1
New York City (assistant to general superintendent, army transport service).....				1		1
On vessels.....					14	14
2 cable steamers.....					2	2
Constructing, post and constructing, and special duty.....				5	20	25
2 military prisons.....				2	2	4
Total.....	1	10	18	39	117	185

UNITED STATES SERVICE.

Quartermaster-General.....	1					1
Assistants in the Quartermaster-General's office.....		2	2	5	2	11
General Staff.....				1		1
Department chief quartermasters.....		3	6			9
Assistants.....					10	10
General depots:						
Depot quartermasters.....		4	3			7
Assistants.....				6	28	34
Depots, and purchasing and distributing offices:						
Officers in charge.....			2	1	4	7
Assistants.....					1	1
Recruiting depots.....					5	5
Remount service:						
In general charge.....			1			1
Officers in charge 4 remount depots.....				4		4
Assistants.....					4	4
Purchasing animals.....				4		4
Post quartermasters.....				6	6	12
Assistants.....					7	7
Army transport service:						
Officers in charge.....						
Assistants.....				2		2
On vessels.....					6	6
Quartermasters for 2 cable steamers.....					2	2
Constructing, post and constructing, and special duty.....				4	17	21
In charge of 2 military prisons.....				2		2
Assistants.....					2	2
Total.....	1	9	14	35	94	153

PHILIPPINE SERVICE.

Chief quartermaster's offices:						
Division chief quartermaster.....		1				1
Assistants.....					2	3
Department chief quartermasters.....			3			2
Assistants.....					3	3
Depot quartermasters:						
Manila, P. I.			1			1
Assistants.....					2	2
Nagasaki, Japan.....					1	1
Post quartermasters.....				2	1	3
Assistants.....					1	1
Army transport service:						
Manila (in charge).....				1		1
Assistants.....					2	2
On vessels.....					8	8
Constructing and special duty.....				1	3	4
Total.....		1	4	43	2	32

NOTE.—All quartermasters on duty in the Philippines to be under direction of the division chief quartermaster and assigned to their stations by orders of the division commander.

* Depot quartermasters at New York City, San Francisco, and Seattle, respectively. The regular assistants in these offices will also be available for duty, in connection with the transport service, to a limited degree.

Duties of officers of the Quartermaster's Department in time of peace under needed increase—Continued.

CONSOLIDATED STATEMENT.

Duty.	Rank.					Total.
	Brigadier-general.	Colonel.	Lieutenant-colonel.	Major.	Captain.	
Quartermaster-General.....	1					1
Assistants in the Quartermaster-General's office.....		2	2	5	2	11
General Staff.....				1		1
Chief quartermasters' offices:						
Division chief quartermasters (Philippines division).....		1				1
Assistants to division chief quartermasters.....					2	2
Department chief quartermasters.....		3	9			12
Assistants to department chief quartermasters.....					13	13
General depots:						
Depot quartermasters.....		4	4			8
Assistants to depot quartermasters.....				6	30	36
Depots and purchasing and distributing offices:						
Officers in charge.....			2	1	5	8
Assistants.....					1	1
Recruiting depots.....					5	5
Remount service:						
In general charge.....			1			1
Officers in charge 4 remount depots.....				4		4
Assistants.....					4	4
Purchasing animals.....				4		4
Post quartermasters.....				8		15
Assistants.....					8	8
Army transport service:						
Officers in charge ^a				1		1
Assistants.....				2		4
On vessels.....					14	14
Quartermasters for 2 cable steamers.....					2	2
Constructing, post and constructing, and special duty ..				5	20	25
In charge of 2 military prisons.....				2		2
Assistants.....					2	2
Total.....	1	10	18	39	117	185

^a Depot quartermasters at New York City, San Francisco, and Seattle, respectively. The regular assistants in these offices will also be available for duty in connection with the transport service to a limited degree.

OFFICERS FOR THE QUARTERMASTER-GENERAL'S OFFICE.

The eleven officers provided as assistants to the Quartermaster-General is the same as the number on duty in his office for a number of years, and hardly as the department has been pressed for officers for service in the department at large it has not been found possible to spare the services of any of them permanently. On the contrary, there were 14 assistants in the office of the Quartermaster-General on June 30, 1909, but it is not considered that number will be required indefinitely. By the proposed plan, however, the rank of the assistants to the Quartermaster-General is different from now, as can be seen by comparison with the table showing the duties of officers of the department on July 1, 1909.

One colonel is contemplated as an assistant to the Quartermaster-General in the general administrative work of the office, to relieve the Quartermaster-General of much routine work and signing of papers he must now do personally, to keep in close touch with the general policies relating to all the administrative work of the department, and to have immediate supervision of the personnel of the department, including commissioned officers, enlisted men, and civilian employees of both this office and the department at large.

One colonel is to have charge of the accounting division. This division is, in effect, the central fiscal agency of the department, and through it is controlled the financial operations of the department under the system of decentralization first successfully put into operation with the beginning of the fiscal year 1909 with most gratifying results as to economy of expenditures and efficiency of administration. Supervision of this work requires an officer of wide experience, thoroughly acquainted with every branch of the department's duties, possessing sound judgment and marked business ability. The importance of this work can not be overestimated.

As the officers performing the foregoing duties would need to give instructions and orders to department and division chief quartermasters and depot quartermasters, and at times review or comment upon their acts, they should be of as high grade as any officer whom they might be called upon to so address.

One lieutenant-colonel is contemplated to have charge of the construction and repair division, which has supervision over the construction of all new buildings of all kinds at military posts and stations, the installation of water, sewer, lighting, and heating systems, construction of wharves, docks, sea walls, roads, and of grading and improvement of grounds; also of all alterations and repairs to and the upkeep of the foregoing. Our modern military posts have cost the Government many millions of dollars, and the repairs alone of the various buildings and utilities connected therewith now exceed two and a quarter million dollars a year. The importance of placing this work in charge of an officer of the rank proposed is thought to be manifest.

One lieutenant-colonel is contemplated to have charge of the purchase and distribution of clothing and camp and garrison equipage to the army and the organized militia. Probably no duty of the department is more important than this of supplying the clothing required by the soldier, his camp and garrison equipage of various kinds, and the tentage to shelter him in field service. Provision must be made for supplies suitable to every known climate. The appropriation for clothing and camp and garrison equipage for the fiscal year 1909 was \$7,000,000, and for the current fiscal year is \$7,000,000, while clothing and equipage to the value of \$991,286.72 have been furnished the organized militia during the fiscal year 1909.

One major is contemplated to have charge of the purchase of such general supplies as fuel, forage, wagons, ambulances, horses, horse-shoes, horse medicines, stoves, ranges, mineral oil, lamps, tools, stationery, typewriters, blank books and blanks, office furniture, and the multitude of miscellaneous articles the department is required to furnish.

One major is contemplated to have charge of the operation of the army transport service, the numerous harbor boats required for communication with many seacoast defense posts, matters relating to their design, construction, repair, supply, etc., and of all matters relating to rail and water transportation by contract, bill of lading, or charter.

One major is contemplated to have charge of the administration of national cemeteries, to consider the multitude of claims of various nature constantly being received, supervise the administrative audit required by law (28 Stat. L., 211; par. 659, A. R.) to be given the

accounts of disbursing quartermasters, and the examination of property returns (par. 706, A. R.), all of which involves a great deal of correspondence.

Two majors and one captain are contemplated as assistants to the lieutenant-colonel in charge of the construction and repair division. One major would have immediate charge of matters relating to plumbing in buildings, lighting and heating systems, and do other duties required of him. One major would have immediate charge of matters relating to water supply and distributing systems, roads, walks, wharves, and drainage, and improvements. The captain would have charge of rental of buildings, camp sites, etc., purchases of furniture, purchases of land, construction of minor importance, the testing of building materials, and any other duties assigned him.

A captain would be assistant to the lieutenant-colonel in charge of the purchase of clothing and equipage. He would be selected from the captains most expert in inspection of textiles, leather, etc., and have immediate charge of all tests of supplies of this nature delivered, and at times be required to visit factories where supplies were being manufactured and inspect the manufacture as well as examine into the work of the officers and inspectors regularly on inspection duty at such places.

A major is contemplated for duty on the General Staff, that being the rank of the officer of this department heretofore detailed for that service.

OFFICERS FOR CHIEF QUARTERMASTER'S OFFICES.

Twenty-eight officers, of whom 4 are colonels, 9 lieutenant-colonels, and 15 captains, are contemplated for duty at division and department headquarters. The colonels and lieutenant-colonels are to be chief quartermasters, one at each of the thirteen such headquarters in the United States and the Philippine Islands. Colonels are contemplated for this duty at headquarters of the Philippines Division, and of the Departments of California, the East, and the Missouri, because of their predominant importance in number of posts, extent of territory, and administrative responsibilities. An additional reason in the Philippines Division is that the division chief quartermaster should be of higher rank than the three department chief quartermasters, whom it is desired should be of not lower rank than lieutenant-colonel. In the Philippines Division the division chief quartermaster bears a relation to department chief quartermasters analogous to that borne in the United States by the Quartermaster-General to department chief quartermasters.

For each chief quartermaster one captain is contemplated as assistant, except for the Philippines Division and Department of the East, for which two captains as assistants are contemplated, because of the greater importance of the two latter headquarters in number of posts, extent and nature of territory, and the character of administrative work devolving upon them.

Some idea of the magnitude of the work of the territorial department chief quartermasters may be gained from the following statement showing the number of posts and total strength of their garrisons, and the amounts of quartermasters funds apportioned for each, viz:

Department of California.—Thirteen posts; garrison, 244 officers, 5,732 enlisted men; total, 5,976. Apportionment, \$1,176,821.02.

Department of the Colorado.—Six posts; garrison, 145 officers, 2,273 enlisted men; total, 2,418. Apportionment, \$799,613.07.

Department of the Columbia.—Nineteen posts; garrison, 299 officers, 5,322 enlisted men; total, 5,621. Apportionment, \$1,508,682.49.

Department of Dakota.—Six posts; garrison, 168 officers, 2,688 enlisted men; total, 2,856. Apportionment, \$671,387.34.

Department of the East.—Fifty-two posts; garrison, 536 officers, 15,173 enlisted men; total, 15,709. Apportionment, \$2,196,870.22.

Department of the Gulf.—Twenty-three posts; garrison, 193 officers, 2,789 enlisted men; total, 4,954. Apportionment, \$1,035,972.81.

Department of the Lakes.—Five posts; garrison, 193 officers, 2,789 enlisted men; total, 2,982. Apportionment, \$1,773,630.59.

Department of the Missouri.—Nine posts; garrison, 522 officers, 10,249 enlisted men; total, 10,771. Apportionment, \$2,333,964.93.

Department of Texas.—Six posts; garrison, 203 officers, 3,648 enlisted men; total, 3,851. Apportionment, \$855,710.85.

The foregoing apportionments include transportation charges, but do not include the cost of clothing issued to troops nor construction work under the supervision of constructing quartermasters.

Philippines Division.—The number of posts varies, but the garrison of the division is approximately 1,025 officers and from 18,000 to 20,000 enlisted men, and the apportionment for the fiscal year 1909 was \$5,610,286 18.

Through the regulations for the decentralization system, approved by the Secretary of War, responsibility rests upon chief quartermasters to see that troops in their departments are properly supplied with all quartermaster's stores, supplies, and services for which apportionments can be made to them, and this office necessarily places reliance upon them for the accomplishment of those duties, and depends upon their recommendations as to the needs of their departments for new buildings, roads, walks, water, sewer, and lighting systems, and repairs, extensions and betterments thereto; and for the economical use of funds intrusted to them to be applied to any and all the quartermaster's purposes of their territorial department. (See Circulars 6 and 7, Quartermaster-General's Office, 1909.) They are administrative and financial agents of the Quartermaster's Department, who must have a comprehensive knowledge of all its duties and also keep in touch with details at the posts of their territorial departments. Upon them falls the immediate supervision and direction of an immense volume of business, distribution of supplies, regulation of transportation, and disbursement of public funds. To the end of promoting efficiency and economy in all these matters they should visit all posts in their territorial departments at least once a year, and the larger ones oftener, and examine into the conduct of the business of the Quartermaster's Department at each, the condition, quality, and sufficiency of supplies and equipment on hand, the shelter of troops and supplies, condition of the buildings, roads, walks, water, sewer, lighting, and heating systems, and all other matters relating to the duties of the department. Capable assistants are required to aid in this work, and have charge of the offices while the chiefs are temporarily absent examining into affairs of the department at military posts and stations, or for other reason.

OFFICERS FOR GENERAL DEPOTS.

For this duty 44 officers are contemplated, of whom 4 are colonels, 4 lieutenant-colonels, 6 majors, and 30 captains.

These general depots are the main agencies of the Quartermaster's Department for the purchase and distribution of supplies, and all are

disbursing offices. They also provide transportation for large quantities of military supplies purchased by other supply departments, and settle transportation accounts. Department and division chief quartermasters, and quartermasters of independent stations, may call upon them direct to ship from stock or purchase and ship any or all the supplies which, in their judgment, can be procured in that way to better advantage than by purchase at posts or in the vicinity of the department headquarters. They are responsible that the supplies furnished by or through them are of suitable quality, or that they are as called for by requisitions, and for the prompt procurement and expeditious delivery of them.

An idea of the volume of business done by the general depots may be gained from the total money value of the transactions of each for the fiscal year 1909, viz:

Jeffersonville, Ind., depot.....	\$4, 927, 014. 48
New York, N. Y., depot.....	3, 792, 566. 98
Philadelphia, Pa., depot.....	4, 136, 311. 98
San Francisco, Cal., depot and army transport service.....	2, 656, 311. 51
St. Louis, Mo., depot.....	1, 023, 893. 67
Washington, D. C., depot.....	2, 184, 324. 13

It is contemplated to place colonels and lieutenant-colonels in charge of general depots, the importance of the depot determining the rank of the officer assigned thereto. The majors will be assistants in the administrative work of the office and divide with their chiefs the responsibility for money or property, management of the clerical force, etc., and at the larger depots the services of at least one of the captains will also have to be utilized upon duties of this class. The other captains will be assistants in charge of purchases, supervising the work of employees of the department employed in manufacture of articles that can best be produced in that way, and be employed in making and supervising inspections at factories, or elsewhere, of supplies manufactured under contract, such as cotton and woolen cloths, clothing, shoes, hats, harness, stoves, ranges, etc.

OFFICERS FOR DEPOTS AND PURCHASING AND DISTRIBUTING OFFICES.

The functions of these officers are of the same nature as those of the general depots, but of a lesser degree of importance. Nine officers are contemplated for this duty—2 lieutenant-colonels, 1 major, and 6 captains. An assistant is now contemplated at but one, Seattle, Wash., where the officer in charge would also be in charge of the army transport and harbor boat service on Puget Sound, with furnishing supplies for mine planters of the coast artillery in that territory, the shipment of animals, and purchase and shipment of forage to the Philippines, and of special supplies to the troops in Alaska. Much of this service, especially as relates to supplies for mine planters, etc., and for Alaska, and the service performed for that department by the Portland (Oreg.) office, relieves the chief quartermaster of the Department of the Columbia, stationed at Vancouver Barracks, Wash., of work for which he would otherwise require an additional assistant. It is probable that assistants will eventually be required for the offices at Chicago and Omaha. These are important commercial producing and distributing centers, and the business of the department with the manufacturing and jobbing interests of each is

constantly growing. This necessity, however, when it arises can be met by transferring officers contemplated for duty at other points to conform to the shifting of business.

QUARTERMASTERS FOR RECRUIT DEPOTS.

There are now five recruit depots to which recruits are sent before assignments to organizations to be given preliminary instruction and furnished with necessary articles of clothing and uniform. The quartermaster's work at these depots in the care of buildings and grounds, supply and care of bedding, issue of clothing, issue and care of miscellaneous supplies and equipment, work in connection with sanitation, and receiving and dispatching recruits is greatly in excess of what it is at a post where a like number of seasoned troops are stationed. These recruits are coming in and going out continually, and as few have had any previous military training, they require constant care and oversight. As only detachments of regular troops for instruction purposes are stationed at these depots, neither regimental nor battalion quartermasters are available, so that it is necessary to provide them with officers of the department for quartermasters.

OFFICERS FOR THE REMOUNT SERVICE.

For this service 13 officers are contemplated—1 lieutenant-colonel, 8 majors, and 4 captains.

The lieutenant-colonel is to have general charge, under direction of the Quartermaster-General, of the remount service and give special attention to the study of types of animals required for the various uses of the military service, including also their care and handling, study and collect data as to the best and most available sources of supply, and the numbers possibly procurable in emergency. Four of the majors are to have charge of remount stations, at which young animals purchased will be kept, handled, and prepared for issue to troops. All cavalry, artillery, and draft animals required for the military service will be furnished from these depots. The four captains will be assistants to the majors in charge of the depots.

Four of the majors will be purchasing officers and will devote their entire attention to exploring horse-raising sections, searching out and purchasing desirable young animals, shipping them to remount depots, and furnishing the officer in general charge of the service with information as to the animals produced in the various sections of the country and the available supply. They will also, incidentally, confer with horse dealers and raisers and give them information and advice as to the classes of horses required by the military service, so as to encourage breeding for suitable animals.

All the officers on this duty are to be selected with a view to their special qualifications for it.

OFFICERS FOR POST QUARTERMASTERS.

For this service 23 officers are contemplated—8 majors and 15 captains. The majors are to be quartermasters at the largest of the posts where there are schools or mixed garrisons, comprising the various arms of the service, and where the duties of the department

are of such importance and the work of such magnitude as to require an assistant, for which duty eight captains are contemplated. The remainder of the captains will be quartermasters at posts where the work and responsibility is not so great, but still of such importance as to demand an officer not subject to change with each change of garrison, or because of promotion. No assistant is provided in the table for the quartermaster at Camp Keithly, P. I., as it is probable that such assistance as he needs will generally be available from regimental headquarters. One captain will doubtless have to be provided from the twenty contemplated for "constructing, post and constructing, and special duty," to have charge of the operation of the Overton-Keithly military road, as assistant to the Camp Keithly quartermaster.

Two assistants are contemplated for Fort Leavenworth and required because of the peculiar conditions obtaining at that post. The Government has an unusually large investment here in buildings, water, sewer, lighting and heating systems, roads, walks, etc., in connection with which there will always be more or less new construction and installation, and a great deal of repair and betterment work. Here also are located the important Army Staff College, Army Signal School, and Army School of the Line, bringing for instruction in each an unusually large number of officers of the army and organized militia, and all arms of the service are represented. All this involves unusual work and responsibility upon the quartermaster at this post in the supervision and upkeep of buildings, grounds, and utilities, the purchase of fuel, forage, etc., responsibility for property and supplies kept on hand, issues, sales to officers, etc. Issues of shoes, clothing, and uniforms alone demand almost the entire time of one officer.

The following statement of the cost to the appropriations of the Quartermaster's Department, except for new construction and articles of uniform issued to troops, of each of the posts in the United States for which it is proposed to supply officers of the Quartermaster's Department for post quartermasters and assistants, is submitted to show the importance of the department's duties at each, viz:

West Point, N. Y.....	\$156, 105. 65
Fort Ethan Allen, Vt.....	164, 467. 52
Fort Monroe, Va.....	126, 969. 17
Fort Sheridan, Ill.....	222, 706. 94
Fort Leavenworth, Kans.....	487, 288. 31
Fort Riley, Kans.....	491, 619. 44
Fort D. A. Russell, Wyo.....	363, 991. 55
Fort Sam Houston, Tex.....	285, 626. 70
Presidio of Monterey, Cal.....	113, 846. 14
Presidio of San Francisco, Cal.....	296, 370. 21
Fort George Wright, Wash.....	76, 070. 79
Vancouver Barracks, Wash.....	181, 039. 17
Fort Snelling, Minn.....	159, 112. 20

Data are not available to show separately the cost of the Philippine Island posts at which it is desired to place quartermasters, but it is known that their importance and cost place them in the same rank as those in the United States named above.

OFFICERS FOR THE ARMY TRANSPORT SERVICE.

For this service 21 officers are contemplated—3 majors, and 18 captains, including 2 captains for quartermasters of the cable steamers operated for use of the Signal Corps.

One major and 2 captains are contemplated for shore duty in the Philippines Division. The major would, either under immediate direction of the division chief quartermaster, or as his assistant, have charge of the operation of all water transportation and make all purchases, contracts and charters of vessels, hire employees, supervise repairs, make disbursements, and issue supplies. One of the captains would be required to assist in this work, making the disbursements, assuming the property responsibility, or through such division of duties as might seem immediately advantageous, and one would be kept busy in supervising the loading, unloading, and dispatching of the numerous vessels employed in trans-Pacific and inter-island transportation of troops and supplies.

One major at San Francisco is contemplated to be in immediate charge of the trans-Pacific transport service and of the harbor boat service, as assistant to the depot quartermaster, who is and always has been the general superintendent of the army transport service on the Pacific coast. In addition, it is probable that a part, or perhaps all, of the time of one of the captains contemplated as assistants to the depot quartermaster will have to be devoted to the transport service. One major is contemplated for the same duty at New York City, where the conditions are about the same, although at present the volume of transport business is not so great. The number of harbor boats and mine planters that are operated or supplied by this depot is, however, greater than that at San Francisco. Conditions might render it necessary to again transfer the base of operations of the Atlantic transport service to Newport News, Va., or some other point more suitable for the time than New York City. In that case, this assistant would be transferred to the new base and become the general superintendent and probably require an assistant, who would have to be supplied through the temporary discontinuance of some less pressing service.

Fourteen captains are contemplated for duty as quartermasters on vessels of the army transport service. These officers almost invariably perform also the duties of transport commissaries.

One freight and four passenger transports, carrying also cargoes, are in constant regular service between the United States and the Philippine Islands, carrying troops, civilian employees and other authorized passengers, and supplies for the army, navy, and other executive departments, and for the Philippine government. One officer is needed and would be constantly occupied in making irregular trips to the Philippines, and Alaska, or on the *Burnside* when employed on the work of the Signal Corps in connection with the Alaskan cable system. Four transports are regularly employed in the Philippine inter-island transport service, and usually five chartered vessels, for all of which transport quartermasters are required. No transports are now in active service on the Atlantic, and should it become necessary to continuously operate any it is contemplated that quartermasters will be provided for them by temporarily suspending some other duties.

Two captains are contemplated as quartermasters of the cable-ships, their duties being similar to those of transport quartermasters, and the quantities of quartermaster's property on board these ships, supplies furnished them, the amounts of disbursements made on their account being sufficient to require the time and attention of a quartermaster for each.

OFFICERS FOR CONSTRUCTING, POST AND CONSTRUCTING QUARTERMASTERS, AND SPECIAL DUTY.

For this service 25 officers—5 majors and 20 captains—are contemplated.

This number of officers is intended to provide officers for construction, whether of new buildings, water, sewer, lighting, or heating systems, roads, walks, wharves, sea walls, drainage, improvement of grounds or related work, or work partly involving some of any number of such subjects; for unusually important alteration, repair, or betterment work of the foregoing nature, as requires the entire time and attention of one or more officers at a post or station; for officers to be both post and constructing quartermasters at posts or stations where the duties are such that they can be combined to advantage; at least one officer to make visits from time to time to posts where important construction projects are in progress, examine into the character of work being done and the fidelity with which the instructions of the Quartermaster-General are being carried out; also to visit department chief quartermasters' offices, general depots, purchasing and distributing offices, and quartermasters' offices at independent stations, and examine into the business and administrative methods, character and quality of supplies purchased and issued, manner of filling requisitions, character and efficiency of the civilian personnel, to the end that faults may be corrected, the accumulation of surplusages of supplies avoided, a uniform policy further developed, and efficiency of the department generally increased; to furnish officers for special duty such as it now being performed by one major of the department in connection with construction of the Panama Canal; to provide for the loss of time by officers sick, changing station between the United States and the Philippines Division, unavoidable delays in filling vacancies occurring among the officers detailed, and all similar incidents of the service, which under present conditions entail overwork on the part of some officers, and the neglect of supervision of some of the work of the department at some point, generally involving delay in completing contracts, issuing supplies, making disbursements, unusual and inadvisable reliance upon civilian employees, or some equally undesirable or uneconomical action.

On July 1, 1909, one major and quartermaster was on special duty with the Isthmian Canal Commission with station in the Canal Zone, and 1 was a constructing quartermaster; 2 majors of the line were acting quartermasters in charge of construction; 1 colonel was on four months' leave awaiting retirement; 1 lieutenant-colonel was under orders and preparing to proceed to the Philippines Division to supervise the unusually important construction work on Corregidor Island; 1 colonel was en route to the United States from the Philippines and 1 lieutenant-colonel was en route to the Philippines from

the United States; 1 major was on leave for thirty days; 16 captains were in charge of construction work; 3 captains were in charge of construction work in addition to other duties, although it would have been better could they have devoted their entire time to either duty, instead of dividing it; 4 captains of the line were acting quartermasters in charge of construction; 23 captains of the line and 26 lieutenants were in charge of construction in addition to other duties. In several instances the entire time of an experienced quartermaster should have been devoted to the work, and in nearly all the others it would have been preferable to have placed an experienced quartermaster in charge of the construction work and required him to also perform the other quartermaster's duties pertaining to the post, than to have followed the course that has been followed, through compulsion of conditions, of placing in charge post quartermasters, who probably had made little or no study of, and had practically no experience in, construction work, and were at best inexperienced judges of the worth, quality, durability, and suitability of the various building materials and supplies entering into the varied classes of construction work done by this department. The number of officers contemplated for the foregoing duties is considered to be a conservative one beyond question.

QUARTERMASTERS FOR MILITARY PRISONS.

This contemplates the same number of officers as are now on this duty, except that the officer in charge of the Alcatraz Island (Cal.) institution is a lieutenant-colonel of the line and an acting quartermaster.

Cost of the increase in the Quartermaster's Department.

	Brigadier-general.	Colonels.	Lieutenant-colonels.	Majors.	Captains.	Total.
Proposed number of commissioned officers.....	1	10	18	39	117	185
Present number of commissioned officers.....	1	6	9	20	60	96
Increase.....		4	9	19	57	89

PAY.

Colonels, 4, at \$5,000 per year (maximum pay of grade).....	\$20,000. 00
Lieutenant-colonels, 9, at \$4,500 per year (maximum pay of grade).....	40,500. 00
Majors, 19, at \$4,000 per year (maximum pay of grade).....	76,000. 00
Captains, 57, at \$3,120 per year (pay after fifteen years' service).....	177,840. 00
	<u>\$314,340. 00</u>

COMMUTATION OF QUARTERS.

[Commutation, \$12 per room per month.]

Colonels, 4; rooms, 7 each.....	\$4,032. 00
Lieutenant-colonels, 9; rooms, 6 each.....	7,776. 00
Majors, 19; rooms, 5 each.....	13,680. 00
Captains, 57; rooms, 4 each.....	32,832. 00
	<u>58,320. 00</u>

HEAT.

[Estimated on regulation allowance of cords of wood, at \$5.52 per cord, average contract price for the fiscal year 1908.]

Colonels, 4.....	\$985. 00	
Lieutenant-colonels, 19.....	2, 086. 00	
Majors, 9.....	3, 985. 00	
Captains, 57.....	10, 697. 00	
		\$17, 753. 00

LIGHT.

[Estimated on regulation allowance of gallons of oil, at \$0.1812+ per gallon, average contract price for the fiscal year 1909.]

Colonels, 4.....	} a 3, 230. 00
Lieutenant-colonels, 9.....	
Majors, 19.....	
Captains, 57.....	

FORAGE.

[Allowance of horses, 2 each, 178; cost per animal per day, contracts of 1909 average \$0.30+.]

Officers, 89.....	19, 491. 00
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HORSE EQUIPMENTS.

Captains, 57, \$72.29 per set (Ordnance Department).....	3, 120. 53
Total cost.....	416, 254. 53

The foregoing is believed to be the greatest cost the increase could involve, unless the cost of some of the supplies furnished should increase, as wood (or coal), mineral oil, and forage. The prices of these, especially forage, are now high. There would be slight incidental expenses, such as lamps and wicks, repairs to ranges and cooking appliances, so that probably it would be safe to estimate \$420,000 per year as the greatest possible cost of the increase.

On the other hand there need be no commutation of quarters to the 3 colonels estimated for as chief quartermaster, Department of the East, and depot quartermasters at Philadelphia and St. Louis, \$3,024; nor for 2 lieutenant-colonels as chief quartermasters, Departments of the Columbia and Texas, \$1,728; nor for the 4 majors in charge of the remount depots, 8 as post quartermasters, and 2 in charge of military prisons, \$10,080; nor for 2 captains, assistants to the chief quartermasters, Departments of the Columbia and Texas, 1 at the Pittsburg depot, 5 at the recruit depots, 4 at the remount depots, 12 at military posts, 2 at the military prisons, and probably 14 (about two-thirds the estimated number) as constructing, post and constructing quartermasters, etc., \$36,720; not all officers would own their full allowances of horses, thus lessening the quantity of forage to be furnished, say at least 10 per cent, valued at about \$1,950, making a total of \$53,482.

It is believed, too, that the pay estimate is in excess of what would be the actual cost for majors and captains and that the minimum cost might be \$60,000, or more, less than the maximum, or about \$360,000.

^a Gas or electric light would cost \$5,042.20 per year, which would add \$1,824.20, making the maximum total cost \$418,078.73.

The average total cost of the increase according to the foregoing estimate would range between \$4,150 and \$4,720 per officer per year.

No estimate of charge against the mileage appropriation is made because it is considered that, as there will be fewer changes of station, with their consequent expenses to the Government, there should be a saving in that direction.

ADVANTAGES AND GAINS AS COMPARED WITH COST OF ADDITIONAL OFFICERS.

It is difficult to resolve into terms of money value the benefits it is confidently believed would follow an increase in the number of officers for the department and the changes in the laws relating to their selection, appointment, detail, etc., herein advocated. Throughout the discussion of those subjects, and generally in the representations herein submitted, it has been pointed out where and in what manner the administration of the department would be bettered through the increase and the changes urged. In the proper places in this annual report it has been shown that some progress has been made toward more efficient service and reductions of expenses, notwithstanding the embarrassments against which, as is explained, the department is now struggling. The success attained in the reduction of expenditures, in a few directions or instances, through such supervision as it has been possible for this office to establish with the number of officers available and under the existing organization of the department, is so often neutralized by increased cost in other directions or instances beyond the control of this office with the present force of quartermasters, and under the existing organization, that the net gain is small. Increases due to market conditions are, of course, beyond control of administrative effort, but all of them can not be accounted for on that ground. Better administration will bring more efficient service; more thorough inspection of supplies delivered, and of buildings, water, lighting, heating, and sewer systems, roads, walks, wharves, etc., constructed under contract; better care and use of supplies; more thorough supervision of issues and of the labor of employees, etc., and through such means result in lessening waste and developing economy in expenditures. While something has been done in this direction, yet it is scarcely a beginning as compared with all that should be done in the interest of real economy. The increase in officers of the department and the changes recommended in their selection, appointment, and detail are absolutely essential to the accomplishment of those results.

At one post the local authorities estimated that 80,000 pounds of coal per month were required for the electric-lighting plant, but investigation by an officer expert in such matters, from this office, showed 58,000 pounds to be sufficient, a reduction of 27.5 per cent; at another 400,000 pounds per month was the post estimate for the combined pumping and lighting plants, and like investigation showed 300,000 pounds to be sufficient, a reduction of 25 per cent; at one small post a reduction of 50 per cent in the quantity of coal used for the lighting plant was found to be practicable.

At the date of preparation of this report exact information as to the use of fuel in the separate heating apparatus installed in buildings is not available. However, the information obtained from such investigation as it has been possible to make indicates that the

consumption of fuel by this means is from 10 to 20 per cent in excess of what it should be. It therefore appears that the consumption of fuel for heating, lighting, and pumping purposes averages about 30 per cent in excess of what it should be, could the use of fuel be properly supervised.

During the fiscal year 1909 the cost of coal for heating, operating, lighting, and pumping plants, and similar uses, except for operation of the transports and other vessels, was \$2,180,483.57. If the percentage of excess consumption shown by the instances cited and indicated by the information available be general, it amounts to about \$654,000 a year.

It is known in this office that the per capita consumption of water at military posts is greatly in excess of, and at some posts from two to three times, that of municipalities supplied by water systems. Considering that at military posts the entire population depends upon the post system for water supply, while a considerable percentage of the suburban population of a city may not depend upon the city supply; that the percentage of animals to persons is usually larger at military posts than in cities, and that at military posts the area of grounds, roads, walks, etc., requiring sprinkling are larger in proportion to those covered by buildings than in cities, it is natural that the per capita consumption of water at posts should be somewhat larger than in cities, but not to the extent which is known to prevail.

It is considered, also, that there is lavish use of electric light at many posts where current is generated by government plants. At the time of making this report it has not been possible to gather exact data as to the quantities of water and electric current generally consumed in excess of necessities, but information available indicates from 20 to 30 per cent to be a conservative estimate of the excess of consumption over liberal provisions for requirements. All this necessitates unnecessary increases in consumption of fuel and engine supplies to operate the plants, causes unnecessary wear and tear on the machinery, and requires the hire of more employees, or higher rates of pay to them, or larger payments to enlisted men for extra duty, than would be necessary if consumption were kept within the reasonably necessary requirements.

The cost of water purchased in the United States during the fiscal year 1909 aggregated \$206,559.82, and if, as is believed practicable, a saving of at least 20 per cent could be made in this expenditure, it would amount to \$41,300. Doubtless, through careful supervision an even larger percentage of saving would be found possible.

At one military post the department was paying 6½ cents per kilowatt hour for electric current for lighting. An investigation of conditions by one of the officers on duty in this office who has made himself an expert on lighting and heating resulted in securing a new scale of prices which will approximate 5½ cents per kilowatt hour for current, a saving of 15.38 per cent, amounting to about \$3,000 per year at one post. At another post, after investigation, the cost was reduced from approximately 9 cents to 6 cents per hour, a reduction of 33½ per cent. At another post where the cost of current is now being investigated, 9 cents per kilowatt hour is being paid,

while it is believed the price should be about 5½ cents, a reduction of 38.88 per cent.

The cost of light purchased in the United States during the fiscal year 1909, practically all of which was in the form of electric current, was \$369,737.62. The average general saving of cost made or believed to be practical, at the posts referred to above, is nearly 30 per cent. If this average of excessive cost applies generally, and there is reason to believe it does, it amounts to about \$110,920 a year.

Notwithstanding the installations and extensions of electric lighting systems at military posts it has been found that the quantity of mineral oil purchased for illuminating purposes increased 5.8 per cent during the fiscal year. This office has no other explanation for the increase than lavish use, the same as in the case of electric current. While certain allowances of illuminating supplies are fixed by paragraphs 1058 to 1069, inclusive, of Army Regulations, it will be noted by reference thereto that paragraphs 1016 and 1059 confer upon local military authorities a wide discretion affecting the total consumption of illuminating supplies. Directly after the passage of the act making appropriations for the support of the army for the fiscal year 1909, this office apportioned, or set aside, \$140,788.96, from the appropriation "regular supplies," for the purchase of mineral oil for illuminating purposes in the United States. This apportionment was determined upon after considering the cost of mineral oil for the preceding fiscal year, the authorized allowances of oil for lights, and the increasing supply of electric current for lighting, and the sum apportioned was deemed ample to meet all reasonable demands. It was, in fact, expected that a saving would be made during the fiscal year. Instead, however, the expenditures in the United States, for mineral oil, from the appropriation "regular supplies" have amounted to \$168,800.15, which is \$28,011.19, or about 20 per cent more than this office contemplated could possibly be required. The total cost of mineral oil purchased by the department in the fiscal year 1909 was \$215,865.63, which is believed to be from 20 to 30 per cent, or from \$43,000 to \$64,750 in excess of reasonably necessary requirements. A continuation of installations and extensions of electric lighting systems at posts and the supply of electric current for lighting seems useless, if the consumption of oil for illumination is also to increase.

During the fiscal year 1909 the sum of \$3,379,062.25 was expended for forage and bedding for animals; the contract obligations for the current fiscal year aggregate \$3,810,118.30; and the estimates for the coming fiscal year are for \$3,774,066.30. The quantity of forage and bedding to be purchased depends upon the total authorized allowance of public and private animals, and the cost depends upon market conditions, which can not be controlled. Both the number of animals to be foraged, as authorized by law, and the contract prices of forage purchased have been increasing for some years past. The proper supervision and inspection of deliveries of forage under contracts, increased attention to its care while in storage, and closer oversight of issues, would, it is believed, result in economy to the possible extent of 3½ per cent of the yearly cost. This, on the expenditures for the fiscal year 1909, would amount to \$118,267.

The total estimated cost of all quartermaster supplies, except clothing, for the fiscal year 1911 is, approximately, \$10,762,500, and will probably continue for future fiscal years at about that sum unless the department is furnished facilities for reducing it through the means herein explained and advocated. The average of savings considered practicable on the examples cited is from 15 to 25 per cent. Should it be found by actual experience that this average of saving would apply to supplies generally it would enable a reduction of from \$1,614,375 to \$2,690,625.

There is much that could be done in the way of modifying specifications for quartermaster supplies so as to bring them more into conformity with similar articles of commercial production, thus increasing competition and lessening the cost of spare parts and repairs to many articles. Better care and closer attention to the manner of use would lengthen the life of many classes of supplies, as stoves, cooking utensils, office, barrack, and mess furniture, wagons, carts, harness, tools, machinery, and the like. At the depots, closer attention of officers to purchases and issues would lessen the accumulations of obsolete or uncalled for supplies, of which there are now accumulations on hand costing when purchased a great deal of money. The operation of the department's decentralization system is already lessening these accumulations and retarding further accretions, but there still remains room for much improvement, were there enough properly qualified officers of the department to give such matters their personal attention and study means of improvement. There are not now enough quartermasters to personally attend to these matters, and it is considered that dependence can not be placed upon employees to bring about the results desired.

The yearly charges for civilian employees of the department at large, and extra-duty pay to enlisted men, against the various appropriations of this department, in the army appropriation act, aggregates over \$5,600,000, and yet there is a constant importunity for increases in both the number and pay of employees and the number of men on extra duty. The rates of pay are not extravagant for employees and extra-duty men who render efficient service, but it is known that a considerable percentage of them do not render efficient service, whether from inability, inattention, or the infirmities of age. Were there sufficient officers to give the employed personnel proper supervision, exact, efficient service in all cases, and weed out the unqualified, indolent, and inefficient, it is certain that a large saving could be made. Better still would be a general-service corps to entirely replace extra-duty service, and to largely decrease the number of civilian employees now necessary.

Ever so small a saving in this item of expenditures would produce a considerable sum to offset the cost of additional quartermasters. It can not be expected, however, so long as quartermasters are unable to remain on duty at any one place long enough to learn who are the efficient and who the inefficient employees, but are compelled to rely for this information on other civilians, generally the associates or intimates, possibly relatives, of the employees upon whose qualifications they are furnishing information to the quartermaster. It is believed, through a closer supervision of employees and extra-duty men by quartermasters and elimination of inefficients, that a yearly

saving of at least 5 per cent, or \$280,000, can easily be made. Besides this would come economies incident to more efficient performance of duties, handling and use of supplies, and facilitation of business.

Elsewhere in this report are discussed the effects of the excessive changes of quartermasters in charge of construction; the too great number and too widely scattered projects with supervision of which they are often charged; the long-existing feeling that through the inexperience of some of them inferior work has been sometimes accepted; and the efforts toward so revising plans and specifications as to reduce the cost of construction.

For the past six years the department has expended an average, in round numbers, of \$7,547,000 per year for construction of new buildings, water, sewer, lighting, and heating systems, roads, walks, etc., for military purposes. The changes among officers in charge of the projects for which these sums were expended has made the continuation of each project according to a uniform policy difficult, frequently impossible, introducing wastes and loss of energy not reducible to terms of any measure, but undoubtedly tending to increase cost of the work, and incidentally adding to the work of this office. The feeling about inferior work rests upon the few known instances that have developed, but it is apprehended that more may develop during use of the completed projects, and these will increase the charges for repairs and upkeep of buildings, water, sewer, and lighting systems, roads, walks, etc.

The remodeling of plans and specifications, so far accomplished through extra labor and exertion, have, it is estimated, effected a saving of about 15 per cent on the classes of construction to which it has been possible to give attention. A like average saving on the average yearly expenditures for construction as given above would be \$1,133,000.

Repairs and alterations to buildings, plumbing, heating apparatus, lighting fixtures, water, sewer, and lighting systems, roads, walks, etc., for the fiscal year 1909 aggregated \$2,284,217. It is believed that if there could be stationed at each important post a quartermaster, not subject to change with every change of garrison, or for other transient reason, and who could be retained there for a sufficient time to familiarize himself with all the buildings, water, sewer, and lighting systems, and like permanent equipment of the post, and lay out a uniform and continuous plan for repairs and improvements, a saving of at least 5 per cent, or \$104,200, could be made in this direction—probably more—and at that be able to keep the posts in better condition than they are now. By acquainting himself with local means of supply, especially of materials entering into construction and repair of buildings, etc., and of fuel and forage, etc., he could make purchases to better advantage than is possible under the present system, and by exercising care in issues of supplies, operation of water and lighting systems and supervising the use of fuel, forage, and supplies generally, he could effect pronounced savings.

SUMMARY.

The instances of possible yearly savings through better management, which are cited above and considered to be practicable, are as follows:

On fuel for heating and operating pumping and lighting plants, etc.	\$654,000
On water purchased	41,300
On light purchased	110,920
On mineral oil for lighting	64,750
On forage	118,267
On employees	280,000
On construction	1,133,000
On repairs	104,200

Total	2,506,437
Maximum estimated cost in salaries and allowances of proposed increase in Quartermaster's Department	420,000

Net savings believed possible on instances cited, at conservative estimate 2,086,437

The total savings above (\$2,506,437) are 12.4 of the aggregate of the expenditures (\$19,498,708) upon which based. The average amount appropriated in the appropriation acts for the support of the army for the six fiscal years beginning with 1905 is \$35,094,759. Should the same percentage of savings be generally possible on the expenditures for supplies, services, employees, construction, and repairs, it would produce on the above average of appropriations a saving of \$4,351,749.

Even should there be few large appropriations for construction in the future, and the percentage of possible savings not generally continue as great as in the instances cited, there would still remain a large probable net gain over the cost of the increase. Deducting the savings on construction (\$1,133,000) from the above aggregate savings on the average of appropriations (\$4,351,749) and reducing the remainder (\$3,218,749) one-half, still leaves a saving of \$1,189,374 over the maximum (\$420,000) estimated cost of the increase.

Appropriations for what are considered to be the current needs of the military service from year to year are made in the yearly appropriation acts for the support of the army with occasional deficiency appropriations when the amounts of the regular appropriations have not sufficed to meet actual needs and the statutes authorize a deficiency to be incurred. Considering only those appropriations, the amounts appropriated for the support of the army, to be disbursed by the Quartermaster's Department in the performance of the duties with which it is charged, have been as follows:

Fiscal year—	
1905	\$33,468,990.33
1906	28,247,450.00
1907	31,668,681.45
1908	36,229,337.81
1909	40,254,191.00
1910	40,699,906.00

The estimates for the fiscal year 1911, which were made on the basis of providing only the bare and unavoidable necessities, and eliminating practically all development, betterment, new construction, improvements or extensions, total \$32,944,620.60.

On the least sum appropriated (\$28,247,450 for 1906) a saving of 1.49 per cent would have paid for the maximum estimated yearly

cost (\$420,000) of the increased number of officers of the department advocated, and 1.28 per cent for the minimum estimated yearly cost (\$360,000) of the increase. On the greatest sum appropriated (\$40,699,906 for 1910), a saving of 1.04 per cent would have paid for the maximum cost and 0.88 per cent for the minimum. The average of the sums appropriated for the six fiscal years is \$35,094,759. A saving of 1.20 per cent on this sum would compensate the maximum, of 1.03 per cent the minimum, and of 1.12 per cent the average (\$390,000) yearly cost of the additional officers contemplated for the department. Were the amounts (usually several millions of dollars) appropriated each year in the sundry civil and special acts, expended through this department, in carrying out the purposes for which made, added to the sums appropriated for the fiscal years named, the above percentages would be greatly reduced.

It is clear, then, that if the department can, by means of the increase in number of officers and changes in the laws advocated, effect a saving of as little as 1½ per cent on the sums usually appropriated each fiscal year for its use in connection with the support of the army, there will result a net yearly saving to the Government of from \$3,700—comparing the smallest appropriation mentioned (\$28,247,450) with the possible maximum yearly cost (\$420,000) of increase—to \$250,000—comparing the largest appropriation (\$40,699,906) with the minimum cost (\$360,000) of increase. The easily practicable savings, given the officers and changes wanted, are not less than 6 and may be as much as nearly 20 per cent on the average yearly appropriations in the army appropriation act only.

The increase in officers will also permit of the return to their proper organizations, or the giving of their entire time to their regular duties, of the 94 officers of the line of the army now doing the work of quartermasters; relieving, to that extent, the complaints against the depletion of commands of commissioned officers through details for detached service.

Based upon the foregoing, it seems clear to this office that the increase in officers, together with the changes proposed in the manner of their selection, appointment, and detail, would result in a marked saving to the Government over and above the cost of their pay and allowances. Every dollar so invested can be made to save two or more, and there would remain the great additional advantage of having officers of the department ready and trained to perform its duties, as prescribed in Field Service Regulations, in case of war, substantially as outlined on page 53 of my annual report for 1908, omitting quartermasters for the purposes omitted in the statement herewith of duties in time of peace; that is, for artillery districts, the mine planters, the Batan mines and Keithly-Overton road, and increasing the number for the remount service and recruit depots. In case of war the latter duties would have to be provided for, and if quartermasters should not be available, officers would have to be taken from other military duties to attend to them. The making effective of the increase and changes advocated will be a great advance toward efficiency and economy. The reform will not, of course, be complete until all officers for quartermasters' duty are officers of the department by appointment and detail in about the ratio advocated, and a general service corps of sufficient strength is established.

POST QUARTERMASTER-SERGEANTS.

The bill contemplates an increase of 50 in the number of these noncommissioned staff officers, the cost of which for one man would be as follows:

Pay per year, at \$57 per month, rate of fourth enlistment.....	\$684. 00
Subsistence per year, at 25 cents per ration.....	91. 25
Clothing, average for one year of three years' allowance.....	53. 50
Heat, regulation allowance for one year.....	66. 24
Light, regulation allowance for one year.....	7. 97
Total.....	902. 96

At the foregoing rate the cost of 50 additional post quartermaster-sergeants would be \$45,148 per year. Some, of course, would have more than four enlistments and some less than four, increasing or decreasing the estimate for pay by \$4 per month for each enlistment of those having more or less than four, but the above is believed to be a fair average.

As these noncommissioned officers would replace a like, or perhaps larger, number of civilian employees at rates of pay ranging from \$1,000 to \$1,800 per year, an actual saving would be effected by this increase, in addition to the benefits to be derived from more effective service and better discipline.

GENERAL SERVICE CORPS.

No new argument presents itself in favor of the establishment of a service corps. Representations as to the need for such corps, and the benefits and economies believed to be possible should it be established, have repeatedly been made in annual and special reports of this office, and they have been corroborated by numerous reports and recommendations of experienced officers of the several branches of the military service. There appears to be almost unanimous opinion that such a corps should be established, would be beneficial to the military service, and result in saving of expenditures. These would seem to demand that a service corps be established, unless there is some strong reason to the contrary with which this office is not familiar.

CLERICAL FORCE.

Little can be said concerning the clerical force of this office that has not been heretofore expressed. The work of the department has been kept up, but to do so has required considerable overtime work on the part of some of the clerical force, and prohibited carrying out a number of plans contemplated for the benefit of the service. The department can get along in a way with the present force, but could do its work in a much better way and give more attention to developing improvements could the force be increased.

The department needs more office room. The rooms it occupies in the War Department building are insufficient and overcrowded; part of the office force is in another building, and its records are widely scattered, some of them being in storage at different places, inconvenient of access, and continually in danger of loss or destruction. It has been impossible to establish a record system in harmony with

the requirements of General Orders, No. 92, War Department, 1909, because of want of room. All this is a disadvantage and increases work to no useful end.

The need for readjustment of salaries, and of provision for superannuated clerks has not lessened, and remarks heretofore made on these subjects are still pertinent, while conditions are more pressing. It has been absolutely necessary to demote a number of old employees in this office and also in the Quartermaster's Department at large, and the needs of the service, under existing conditions, will compel a continuation of this action until finally the aging employees will become entirely separated from the service. If they have been fortunate and provident during those years when the salaries paid government employees left a fair margin over living expenses, they may have amassed a competence for their short remaining span of life. If they have been improvident or unfortunate, humane relatives or kind charity may provide for the wants of their last days. It is not argued that such a condition is equitable, but the inexorable demands of public business leave no other course. Some legislation would be welcomed that would remove the embarrassing necessity of having to recommend the demotion or discharge of employees who have faithfully and efficiently given the best years of their lives to the government service, and against whom the only charge is that advancing age is reducing their efficiency.

Respectfully submitted.

J. B. ALESHIRE,
Quartermaster-General, U. S. Army.

THE SECRETARY OF WAR.

REPORT OF THE COMMISSARY-GENERAL.

REPORT OF THE COMMISSARY-GENERAL.

WAR DEPARTMENT,
OFFICE OF THE COMMISSARY-GENERAL,
Washington, D. C., October 5, 1909.

SIR: I have the honor to submit the following report of the operations of the Subsistence Department for the fiscal year ending June 30, 1909:

RESOURCES, DISBURSEMENTS, AND BALANCES.

The following statement exhibits the aggregate fiscal resources and disbursements of the department and the balances at the close of the fiscal year 1909:

REPORT OF FINANCIAL TRANSACTIONS OF THE SUBSISTENCE DEPARTMENT DURING THE FISCAL YEAR ENDING JUNE 30, 1909.

Appropriation, subsistence of the army, 1909.

[Act of March 3, 1909, 35 Stats., 115.]

Resources:	
Appropriation.....	\$7,382,951.45
Receipts.....	3,276,262.39
	<hr/>
	10,659,213.84
	<hr/>
Disbursements.....	10,497,392.85
Balance.....	^a 161,820.99
	<hr/>
	10,659,213.84

RECEIPTS.

Sales to officers and enlisted men.....	\$2,519,082.22
Sales to civilian employees.....	227,994.30
Sales to officers and enlisted men, organized militia.....	25,287.47
Sales to bureaus and departments of the Government.....	188,491.89
Sales, miscellaneous.....	32,153.29
Collections, account errors, gains, reclamation, refundment, transportation.....	16,476.37
Meals on transports.....	121,444.02
Transfer settlements made by Treasury Department, account supplies furnished various bureaus and departments of the Government.....	134,929.83
Miscellaneous deposits made to credit of appropriation, account paymasters' collections, etc.....	10,403.00
	<hr/>
	3,276,262.39

^a The amount of outstanding indebtedness on June 30, 1909, was \$404,413.09, thus making necessary a deficiency appropriation to meet liabilities unpaid of approximately \$243,000.

DISBURSEMENTS.

Ration articles, including savings and other authorized issue articles purchased.....	\$7, 254, 103. 83
Stewards' stores.....	203, 071. 96
Hot coffee for troops traveling.....	14, 133. 55
Meals for recruiting parties, etc.....	238, 970. 33
Sales stores.....	1, 464, 236. 65
Cooking apparatus.....	33, 232. 48
Post bake ovens.....	31, 707. 09
Subsistence property.....	56, 906. 52
Commutation of rations to cadets, West Point.....	44, 057. 70
Commutation of rations to enlisted men.....	622, 106. 93
Compensation to civilian employees, Subsistence Department.....	257, 228. 42
Compensation to civilian employees, transport service, and board wages.....	212, 911. 42
Extra-duty pay to enlisted men.....	39, 150. 85
Prizes to enlisted graduates of the army schools for bakers and cooks..	735. 00
Incidental expenses.....	20, 526. 17
Correction of errors and transportation turned over to Quartermaster's Department.....	2, 956. 97
Transfer settlements made in Treasury Department, account of supplies received from various departments of the Government.....	1, 356. 98
	<hr/> 10, 497, 392. 85

BALANCES.

Amount in Treasury to credit of Subsistence Department, June 30, 1909	36, 245. 04
Amounts to credit of officers in depositaries and in personal possession, June 30, 1909.....	125, 575. 95
Total.....	<hr/> 161, 820. 99

Appropriation, subsistence of the army, 1908.

[Act March 2, 1907, 34 Stats., 1165.]

Resources:	
Balance reported June 30, 1908.....	\$501, 884. 98
Receipts.....	49, 271. 98
	<hr/> 551, 156. 96
Disbursements.....	299, 716. 39
Balance.....	251, 440. 57
	<hr/> 551, 156. 96

RECEIPTS.

Amounts collected from various sources by Treasury Department.....	37, 433. 61
Miscellaneous deposits, paymasters' collections, etc.....	5, 727. 88
Sales to United States Navy and Marine Corps.....	112. 96
Meals (transports).....	2, 558. 61
Collections, account errors, reclamation, transportation.....	3, 438. 92
	<hr/> 49, 271. 98

DISBURSEMENTS.

Ration articles, including savings and other authorized issue articles purchased.....	148, 898. 47
Sales stores.....	65, 461. 87
Hot coffee for troops traveling.....	199. 17
Meals for recruiting parties and recruits.....	4, 712. 02
Stewards' stores.....	370. 54
Subsistence property.....	18, 427. 33
Commutation of rations to cadets at West Point.....	3, 849. 90
Commutation of rations to enlisted men.....	12, 689. 50
Compensation of civilian employees, Subsistence Department.....	354. 61

Compensation of civilian employees, transport service, and board wages..	\$1,568.16
Extra-duty pay.....	23.50
Cooking apparatus.....	23,370.65
Post bake ovens.....	7,558.68
Incidental expenses.....	2,609.17
Correction of errors and transportation.....	467.18
Settlements made by Treasury Department.....	9,155.64
Total debits.....	299,716.39

BALANCES.

Amount in Treasury to credit Subsistence Department June 30, 1909.....	249,518.09
Amounts to credit of officers in depositaries and in personal possession June 30, 1909.....	1,922.48
	251,440.57

Appropriation, subsistence of the army, 1907.

[Act June 12, 1906, 34 Stats., 249.]

Resources:	
Balance reported June 30, 1908.....	\$629,268.59
Receipts.....	710.19
	629,978.78
Disbursements.....	154.02
Amount carried to surplus fund by Treasury Department, June 30, 1909.....	629,824.76
	629,978.78

RECEIPTS.

Amounts collected from various sources by Treasury Department.....	552.58
Miscellaneous deposits account of sales, etc., in Treasury Department....	112.47
Correction of errors, reclamation.....	45.14
	710.19

DISBURSEMENTS.

Settlements by Treasury Department.....	154.02
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Appropriation, subsistence of the army, 1909-10.

[Act March 3, 1909, 35 Stats., 741.]

Amount appropriated for extraordinary expense of subsistence of West Point cadets while attending inaugural ceremonies March 4, 1909.....	\$1,587.00
Disbursed.....	760.00
Balance.....	827.00
	1,587.00

BALANCE.

Amount in Treasury to credit of Subsistence Department, June 30, 1909..	827.00
---	--------

Appropriation, encampment and maneuvers, organized militia, 1908.

[Act March 2, 1907, 34 Stats., 1164.]

Resources:	
Balance reported June 30, 1908.....	\$33,248.08
Receipts.....	6,574.99
	39,823.07
Disbursed.....	18,104.27
Balance allotment.....	21,718.80
	39,823.07

RECEIPTS.

Treasury receipts.....	\$6,574.99
------------------------	------------

DISBURSEMENTS.

Ration articles, including savings and other authorized issue articles....	3,449.27
Hot coffee for troops traveling.....	139.00
Meals while traveling.....	2,882.30
Transfer settlements made in Treasury Department.....	11,633.70
	<hr/>
	18,104.27

BALANCES.

Amount of allotment in Treasury June 30, 1909.....	21,718.80
--	-----------

Appropriation, encampment and maneuvers, organized militia, no year.

[Act May 11, 1908, 35 Stats., 115.]

Allotment of appropriation made by Secretary of War.....	\$84,233.10
Receipts.....	6,645.66
	<hr/>
	90,878.76
	<hr/>
Disbursed.....	72,333.86
Balance allotment.....	18,544.90
	<hr/>
	90,878.76

RECEIPTS.

Treasury receipts.....	6,645.66
------------------------	----------

DISBURSED.

Ration articles, including savings and other authorized issue articles purchased.....	5,897.89
Hot coffee for troops traveling.....	2,181.09
Meals while traveling.....	8,011.59
Commutation of rations to enlisted men.....	250.90
Transfer settlement made in Treasury Department.....	55,992.39
	<hr/>
	72,333.86

BALANCES.

Amount of allotment in Treasury June 30, 1909.....	18,544.90
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THE UNITED STATES ARMY TRANSPORT SERVICE.

DEBITS.

Salaries of civilian employees and board wages (including employees of office of subsistence superintendent in work pertaining to the transport service).....	\$212,911.42
Cost of foods furnished in the several messes.....	478,066.34
Commutation of rations to patients in hospital.....	4,799.60
Value of ice dropped as wastage.....	8,045.15
Miscellaneous.....	83.95
Losses on stores due to deterioration.....	1,037.07
Losses on property.....	101.45
Value of property expended.....	1,129.76
	<hr/>
	706,174.74

CREDITS.

Cash collections for meals.....	\$106,538.39
Amounts paid and collectible on account of meals furnished bureaus and other departments of the Government.....	50,458.18
Miscellaneous sales.....	928.57
Gains in stores.....	190.34
Credit given for value of issues to troops, civilian employees, and general prisoners.....	92,903.04
	<hr/> 251,018.52

SUMMATION.

Total debits.....	706,174.74
Total credits.....	251,018.52
	<hr/>
Net cost.....	455,156.22

If credit were allowed for sum of \$40,996.04, owing to additional cost of unusual expenditures in transport service on account of Cuban expedition, the net cost would be but \$414,160.18.

STATEMENT OF ISSUES MADE DURING FISCAL YEAR 1909.

Garrison, field, travel, haversack, and trail rations (27,263,444), average cost, 21.0488 cents.....	\$5,738,625.52
Filipino rations issued (2,126,140), average cost, 13.10 cents.....	278,612.38
Emergency rations (10,904).....	3,758.45
Articles other than ration articles issued.....	101,005.84
Ice issued.....	63,098.31
Recruit kits issued.....	55,430.68
Gratuitous issues to destitutes, etc.....	485.88
Reimbursement issues.....	2,739.80
Issues to Indian prisoners of war.....	12,081.64
	<hr/>
Total value of issues.....	6,255,838.50

Losses.

DEBITS.

Ordinary wastage and losses in issue and transportation.....	\$27,956.25
Deterioration of stores from climatic causes, etc.....	19,686.05
Theft.....	221.83
Fire.....	63.51
Property expended and worn out in the government service.....	86,806.04
	<hr/>
Total debits.....	134,733.68

CREDITS.

Reclamations made from carriers and contractors.....	\$4,758.00
Receipts from sales at auction of deteriorated supplies.....	4,150.81
Gains on stores (account issues).....	8,037.34
Gains on property.....	2,094.84
	<hr/>
Total credits.....	19,040.99
Net losses.....	115,692.69

The losses above referred to occurred in geographical divisions, as follows:

United States.....	\$81,224.62
Philippine Islands.....	29,558.26
Alaska.....	3,190.48
Transports.....	2,268.28
Hawaii.....	783.70
Cuba.....	17,116.85
Porto Rico.....	591.49
	<hr/>
Total.....	134,733.68

It may be noted in connection with the subject of losses—though not strictly an item of loss—that the value of ice used for the preservation of stores amounted to \$47,246.08.

It is impossible to prevent losses on perishable stores such as fresh vegetables, fresh beef, and other delicate and perishable articles, on account of trying climatic conditions and transportation, particularly in the Philippine Islands and Alaska. The losses are almost invariably due to these conditions, and not to lack of care in protecting and preserving stores.

The greatest effort has at all times been exercised to prevent losses, and the result has been particularly gratifying for the period covered by this report, in view of the increase in the quantity of perishable articles supplied.

Any reductions in losses have been principally due to the intelligent supervision of chief commissaries, the expert knowledge and care of purchasing commissaries in selecting the stores, the careful handling of them after receipt, and to the frequency of supply—always affording adequate stores for needs, and leaving as little as possible for deterioration.

POST COMMISSARY-SERGEANTS.

The number of post commissary-sergeants in the service during the fiscal year was as follows:

In service July 1, 1908.....	198
Appointed during the year.....	27
Total.....	225
Separations:	
Retired.....	17
Deserted.....	3
Discharged.....	1
Appointment revoked.....	1
Died.....	1
Appointed in Philippine scouts.....	2
	25
In service on June 30, 1909.....	200

A number of post commissary-sergeants have entered the training school for bakers and cooks to take a thorough course of instruction in baking and cooking. Post commissary-sergeants have taken a course of instruction at St. Louis in setting up ovens, so that they are thoroughly trained, and are available to be sent around to stations to do this kind of work instead of having to employ a civilian expert at considerable expense.

CLERICAL FORCE.

The clerical force has been fully employed and has rendered satisfactory service during the year. Attention is invited to the fact that this office has a lower percentage of high-grade clerks than any other bureau of the War Department in which the work is closely allied to that performed in the office of the Commissary-General. The duties required of the higher-grade clerks are responsible and exacting, and there are too few of such positions, and many perform most important work who are inadequately compensated. The

lack of these high grades makes the prospect of advancement discouraging, and in this connection it may be stated that owing to the slender prospect of promotion two resignations have virtually occurred on such account in this office recently, and from time to time others have transferred to various departments and been given adequate salary and promotion. This state of affairs tends to keep the office force disturbed and deprives it of the services of desirable clerks who have been trained and are just in a position to render valuable service when they either resign or transfer elsewhere. This action on their part is natural and no blame can attach to them on that account.

PHILIPPINES DIVISION.

There are 28 regular posts in the division which were supplied with subsistence stores from the depot in Manila and 30 subposts which were supplied with rations from the main posts or the sales and issue commissary at Manila.

The bulk of the supplies came from the United States, the purchasing points being divided between New York, St. Louis, Chicago, Kansas City, Omaha, and San Francisco.

The following articles were purchased in Manila, as the cost, including transportation, rendered it advantageous to procure them there: Rice, potatoes, onions, blackberry jam, granulated sugar, butter, soda crackers, ginger ale, assorted jam, currant jelly, unsweetened condensed milk, mushrooms, ground mustard, olive oil in bottles and cans, olives, cayenne pepper, table salt in bottles, and glycerine toilet soap. Chocolate, plain and vanilla, was purchased at Manila, but owing to complaints regarding its quality all contracts were canceled and the point of supply changed to San Francisco. With few exceptions the stores were of satisfactory quality.

Frozen fresh beef and mutton were, as in the past, supplied from Australia under annual contract at the following prices: Beef at 7.88 cents per pound and mutton at 7 cents per pound.

Potatoes and onions were purchased locally under four months' contracts, the contractor having the option of supplying these products from Japan, Australia, America, or other source, provided the deliveries came up to the required standards. The bulk of the potatoes and onions came from Japan. The prices for potatoes ranged from \$2.10 to \$2.40 per hundred pounds, and the onions from \$1.80 to \$2.45 per hundred pounds. By requiring deliveries of small quantities and making frequent shipments to posts, so that no surplus was carried on hand in Manila and only a small surplus at posts, the losses were not excessive.

Upon the statement in the report of the Philippines Commission for the fiscal year 1908, that an excellent quality of Irish potatoes is being grown in Benguet Province, the matter was taken up by this office with a view to investigate the possibilities of producing potatoes and onions for the needs of the army. It was thought that even if all of the potatoes and onions, potatoes particularly, required in the division could not be produced there it would be advisable to undertake the production of such portion as would be possible, and in time the cultivation of vegetables would develop into greater proportions.

With the cooperation of the Insular Bureau, and the assistance of the Quartermaster's Department to furnish the necessary number of animals and wagons to aid in the cultivation, the Subsistence Department has provided the required agricultural implements and seed potatoes to make an experiment in Mindanao Province, as the chief commissary of the department of Mindanao reports that potatoes can be grown to advantage in the highlands about Lake Lanao. Already gardens have been started at Camp Vicars by Colonel Glenn and they are doing exceedingly well, the potatoes being of good size, fair quality, and of very good flavor.

There is a great advantage in the cultivation of vegetables in the Philippines from the fact that four crops a year can be raised, and the Moros are natural agriculturists, and labor is plentiful and cheap. The experiment is proceeding under the supervision of the chief commissary of the division, and it is believed will be successful. In the event it is, it will result in an adequate and prompt supply of fresh potatoes for the army in the Philippines, save large losses, which are incident to the supply of such a perishable article as potatoes, be a great saving also in the actual cost of the article to the Government, and finally solve a troublesome and difficult problem.

Steps have been taken to install at all posts considered permanent a continuous baking oven, and to repair the ovens already at the posts with a view to their use in emergencies, and to provide temporary posts and small scout posts with such suitable types of ovens as may be warranted by existing conditions.

CUBA.

During the period from July 1, 1908, to the close of the period of occupation of the army of Cuban pacification, the chief commissary of that army stated that the rations and sales stores furnished at the posts in Cuba were "of the usual high standard" and that only a few complaints were received, which were promptly rectified by the purchasing officers. The quality of the fresh beef was entirely satisfactory, and losses on the same were very slight. Beef was procured in the United States for all posts except Camaguay and Morro barracks, which were supplied with native beef. After it was definitely determined to withdraw the troops of the United States from Cuba only sufficient stores to supply them until their departure from the island were kept on hand; and on the final abandonment of Cuba the stores at the subsistence depot at Havana were shipped to the purchasing commissary at New York—those remaining on hand at interior stations having been transferred to Havana, except those at Morro Barracks, which were shipped direct to the purchasing commissary at New York. Subsistence property that was found to be serviceable and worth the cost of transportation was taken by the troops from the various posts to their home stations, and the remainder disposed of as recommended by the Inspector-General. The subsistence property on hand at the subsistence depot at Havana was shipped to the purchasing commissary at New York. The departing troops were rationed to date of embarkation, except enlisted men going with animals, who were rationed to their home stations.

An itemized account has been kept of all expenditures additional to those which would have been necessary if the force comprising the army of Cuban pacification had been stationed in this country. The additional amount so expended during the entire period of occupancy, including the expense incident to the operation of the stewards' department on the transports exclusively engaged in the supply of these troops, is \$533,822.73.

RATIONS FOR OFFICERS AND CIVILIAN EMPLOYEES SERVING IN THE FIELD.

I renew my recommendation that officers and civilian employees serving in the field be allowed one ration each per day.

Authority of law is required to make these issues to officers, and it is hoped that the measure will meet the approval of the Secretary of War and be by him commended to the favorable consideration of Congress.

SERVICE CORPS.

I desire to most earnestly renew the recommendation contained in my last annual report with regard to the organization of a service corps. It is believed that no other organization could be provided which would so largely increase the efficiency of the service as the establishment of a service corps. A bill providing for the creation of this corps was introduced in the first session of the Fifty-ninth Congress, on January 30, 1906 (S. 3926), and it is most urgently recommended that this matter receive the favorable consideration of the Secretary of War and be recommended to Congress.

FIELD RANGES AND OVENS.

Upon recommendation of this office of September 25, 1908, a board of officers was appointed, as per Special Order 226, War Department, 1908, to meet at Fort Riley, Kans., to consider among other matters a suitable field range and bake oven, and in such connection to verify and improve, if feasible, upon a field range and bake oven that had already been experimented with by the Subsistence Department with favorable results. It was thought that the best results would be obtained through a board consisting of the experienced officers in charge of the schools for bakers and cooks, who had made a study of this particular line of work, who were well qualified to look at the whole matter from the same point of view, and were recognized throughout the service as experts on all matters connected with such subjects, and in addition were line officers. Their investigations were to be aided by the experience and training of the purchasing commissary at St. Louis, who purchases most of the cooking and bakery appliances used in the army, and whose advice would be of material assistance.

The field range recommended by the board was submitted to the infantry equipment board, and the latter board not approving the range for all conditions of field service, orders directing the two boards to meet together for the determination of this matter have been issued. No design of a field bake oven has yet been developed.

FIRELESS COOKERS.

The fireless cooker has been perfected. It was exhaustively tried out and favorably reported upon by officers of organizations and others. But after these trials, which showed the cookers to be entirely satisfactory and producing excellent results, it was found that the majority of the officers only desired them as an adjunct to the field equipment, and not in substitution of such equipment, which would necessitate field equipment beyond what it is thought advisable.

TRAINING SCHOOLS FOR BAKERS AND COOKS.

Since the establishment of the training schools for bakers and cooks at Fort Riley, Kans., Washington Barracks, D. C., and the Presidio of San Francisco, Cal., 421 bakers and 891 cooks have been graduated. Of this total, 119 bakers and 292 cooks were graduated during the fiscal year 1909, and 302 bakers and 599 cooks during the previous years.

The number graduated at the different schools was as follows: At Fort Riley, Kans., 81 bakers and 155 cooks during the present year, and 164 bakers and 303 cooks during previous years; at Washington Barracks, D. C., 19 bakers and 89 cooks during the present year, and 47 bakers and 131 cooks during previous years; at Presidio of San Francisco, Cal., 19 bakers and 48 cooks during the present year, and 91 bakers and 165 cooks during previous years. The total number of officers who have graduated from the schools at Fort Riley, Kans., is 23.

Some well-considered changes have been made in the system and methods at the School for Bakers and Cooks at Fort Riley. Among them a scheme by which officers in the cooking course are assigned to duty in pairs in the instruction kitchens, and assist the cooks on duty in the preparation of meals; and in the baking course instruction has been extended to include baking in open trenches and improvised earth ovens, as well as several types of experimental field ovens. A regular course of instruction and recitation in handling accounts, figuring out ration returns and savings, was instituted during the year.

Now that facilities have been extended so as to include a course in handling accounts, and an opportunity for intelligent noncommissioned officers to handle a kitchen as a mess sergeant, under expert supervision, commanding officers are afforded a favorable opportunity to send reliable noncommissioned officers with several enlistments to their credit to take the course of mess sergeant. The sergeants are given special instruction in handling the bread ration, practical work in the post bakery, in the meat shop, working with field expedients, and instruction of improvised ovens, etc. In other words, receiving the instruction necessary to qualify them to perform the important duty of mess sergeant and be able to render intelligent assistance to the company commander in the most important work of management of the company mess.

An officer in charge of one of the training schools for bakers and cooks took a course of instruction in fresh beef inspection at the Chicago stock yards last year, so that he could improve the course of instruction regarding beef inspection at the school.

A demonstration of field bakery equipment was also made at various places, which demonstrated the suitability of the same, and earned the unqualified approval of army authorities and the praise of

competent judges who had no connection with the service. The baking was done with the equipment developed by the Subsistence Department, and it is work which has never before been accomplished in this line by any army bakery equipment.

KITCHEN TOURIST CAR, DETACHMENT MESS CAR, AND PORTABLE GAS COOKER.

The kitchen tourist car, detachment mess car, and portable gas cooker have been thoroughly tried out and found satisfactory.

The kitchen tourist car is a new model sixteen-section tourist car with two sections removed to make room for the range and cooking equipment. One of these cars is capable, with the two cooks provided with the Pullman car, who are familiar with the use of the cooking appliances and the storage of food supplies, of providing meals for as many as 300 men; and an adequate supply of these cars is ordinarily kept on hand by the Pullman company to meet the requirements of the army.

The detachment mess car is an old-style fourteen-section tourist car with one retiring room removed and the space turned into a buffet kitchen. The cooking appliances are adequate to furnish meals for 50 men using the garrison ration, or if travel rations and hot coffee only are used 100 men can be subsisted. A supply of these cars is kept on hand by the Pullman company ready for service..

The portable gas cooker was designed by Maj. Charles R. Krauthoff, with the aid of Capt. F. W. Stopford, of the Subsistence Department. It includes a stove and utensils, all of which can be packed and carried within the compass of an ordinary trunk. It is operated by gas supplied from tanks, and is for use of troops traveling by rail, in cars equipped with Pintsch gas for lighting purposes. The cooker has a capacity for providing hot coffee and hot food for 48 men—the maximum carried in one car. It can be used when traveling by Pullman tourist or standard sleeping cars, when traveling in ordinary day coaches, when troops accompany horse trains, and for use in cars composing hospital or Red Cross trains to heat hot water and prepare soups, broths, and other special diet. The outfits are kept stored at convenient depots of supply of the Subsistence Department—New York, St. Louis, and San Francisco—so as to be ready for use in an emergency of railroad travel.

These devices save time, effect economy, and enable the soldier to enjoy well-cooked food, and at the same time to be comfortably served. They have revolutionized the old system of providing for subsistence of troops traveling, and are a solution of what has been for years a difficult problem. In times of war or emergency these cars and the gas cooker can be used for hospital purposes.

In connection with this subject the chief commissary, Department of the East, in his annual report, remarked:

Arrangement made with the Pullman company during the year through which "kitchen tourist cars" are provided, with cooks and helpers, in movements by rail or organizations for journeys exceeding forty-eight hours and the number of men to be transported forty or more, and the "detachment mess car" for smaller bodies, has revolutionized the ancient system of providing for subsistence of troops en route, and from all reports received has apparently found a satisfactory solution of what has been for years a most troublesome problem. Under the new system it is entirely practicable for troops traveling to make use of the garrison ration exactly as if in barracks, well cooked and comfortably served to any number of men.

SUBSISTENCE OFFICERS ATTENDING FOOD AND OTHER CONVENTIONS.

The Subsistence Department is greatly interested in all food experiments. The question of food so vitally affects the department that it is the aim to keep in touch with all food conventions and have an officer detailed to and thoroughly informed of all that takes place at such conventions. It is of inestimable advantage for officers to hear the different subjects discussed by experts and recognized authorities, and in addition to listening to the discussions, to have an opportunity to engage in conversation the practical and experienced men in the various lines who may be in attendance. Many interesting papers are read and many valuable suggestions are made at these conventions which can be utilized by officers of the department along lines they are investigating or engaged upon.

Upon invitations extended to the Subsistence Department, officers of the department attended the following conventions during the year:

Association of Official Agricultural Chemists, held at Washington, November 12 to 16, 1908; attended by Capt. F. J. Koester, commissary; Capt. F. A. Cook, commissary; and Capt. James A. Logan, jr., commissary.

International Live Stock Exposition, held at Chicago, November 28 to December 10, 1908; attended by Capt. Edward Anderson, commissary.

National Dairy Show Association, held at Chicago, December 2 to 10, 1908; attended by Capt. Edward Anderson, commissary.

National Association of Cannerymen and Allied Organizations, held at Louisville, Ky., February 1 to 6, 1909; attended by Col. A. D. Kniskern, deputy commissary-general.

The International Congress on Tuberculosis convened at Washington September 21, 1908. Dr. D. Arthur Hughes, veterinary inspector of the Subsistence Department, was invited to attend and read a paper on "Precautionary sanitary legislation against tuberculosis of the domesticated animals in the States included in the United States of North America."

THE NEW ARMY RATION.

The new army ration, which was established by executive order of March 5, 1908, had not been on trial long enough when the last annual report was submitted to give a well-considered opinion concerning it. Since then the views of subsistence officers, commissaries at posts, and others have been received, and it is almost the universal opinion that the present garrison ration is ample and satisfactory. Practically the only change urged is that flavoring extracts and spices should be stricken off and the sirup portion largely reduced, and that the money amounts of these articles be applied to the acquisition of additional quantities of butter and milk. This plan is in effect pursued now, under the savings privilege, which affords the greatest food variety, but it would be more advisable to do away altogether with the articles which are converted into savings and apply the money value to other components of the ration which are more desired, for the greater the variety of articles supplied the larger the losses will be. If the articles referred to are eliminated and their value applied to the increase of those desired, it can be effected without increasing the total cost of the ration. Such a change could be effected by executive order, and it is the intention later to submit a recommendation to this effect.

It is the aim of the Subsistence Department to comply with and insist upon the observance of the pure-food law and all necessary sanitary laws in the purchase of articles by the department; and to help in this direction paragraph 1238, Army Regulations, as amended by General Orders, 120, War Department, 1909, provides that when ration articles are on hand in the commissary, purchases of such articles with company funds must be made from the commissary. This stops the practice of making savings and permitting a commander of an organization or a noncommissioned officer to use the funds to purchase elsewhere uninspected and cheaper articles of the ration in preference to those furnished by the Subsistence Department, which are purchased by experts, thoroughly tested, insuring a standard quality, and procured in large quantities at minimum prices. A further safeguard is afforded by paragraph 1265, Army Regulations, amended by General Orders, No. 122, War Department, 1909, which does away with bartering, which always leads to peculations and scandals.

The savings privilege and the requirement that ration articles purchased with company funds shall be purchased from the commissary, added to the provision forbidding bartering of stores purchased or drawn from the commissary, removes practically all the abuses complained of in the past and makes the ration all the more effective.

PURCHASE OF CANNED VEGETABLES.

During the past year a new plan has been adopted for procuring canned vegetables. Under it advertisements are issued, and purchases are made at the close of the canning season of such quantities as may be required to last the army until the next canning season. The vegetables are purchased while there is an ample supply in the market to select from, and the prices are the lowest because of the large quantities purchased, either direct from the factories or in large commercial centers. Preference is given in the advertisement to vegetables packed in sanitary enameled lined cans, but proposals are invited for them packed in three styles of cans—the sanitary enameled lined can, the enameled-lined can, and the ordinary can—as experience has shown that sanitary enameled lined cans are best suited for the purposes of the Government, and an effort is being made in this way to educate the bidders to follow the preference of the department. The sanitary enameled lined can adds little to the expense, while it helps to insure the purity of the contents and saves considerable loss, especially in the case of tomatoes, which show a marked reduction in loss when packed in this can, so that owing to the season when the vegetables are procured, the ample stock from which selected, large purchases, thorough inspection, and style of can, the choicest and most satisfactory vegetables are procured at the lowest prices.

INSPECTIONS FOR OTHER DEPARTMENTS.

Upon the request of other departments, the Secretary of War authorized the Subsistence Department to make inspections during the year for various departments. This was for the purpose of having the supplies tested by trained experts to insure that the supplies were in quantity, quality, and every particular up to specifications and requirements.

ADOPTION OF NEW OFFICE AND BUSINESS METHODS.

The new system of cost keeping devised by this office has now been in operation for over a year, has had a thorough trial, and proven satisfactory. The condition of the work thereunder pertaining to the finance division can be ascertained upon short notice.

Under this system the receipts and expenditures as shown by accounts, and the issues and losses as shown by returns, are analyzed and entered in the cost book under proper headings. This book is kept by departments and shows receipts, expenditures, issues, and losses at each post in each department in the United States and the Philippines and on transports, and also the total for each during the fiscal year. In order to obtain this data it is necessary to take every one of the accounts and returns which come in—over 300 accounts and 200 returns each month—and make an analysis of them, so that when it is shown, for instance, that an officer disburses a given sum during the month, an analysis is made of how he disposed of every one of the items. This multitude of items is then transcribed with great care to see that the summation for the month agrees with the receipts, expenses, issues, and losses. From this data a cost statement is prepared at the close of each fiscal year showing, by departments, under proper headings, the total yearly receipts, expenditures, issues, and losses for each post in the several departments, the Philippines, and on transports, together with the grand total by departments for the fiscal year. The actual value of food issued at each post is figured out. These figures are taken as a basis for making estimates to Congress, and as time goes on this data will afford an actual table of food cost, thus leaving in the preparation of estimates little to be assumed, for the actual figures will be available for the purpose. This work, together with the statement, which is the crystalized result of the year's transactions, requires labor of the most thorough and painstaking kind.

Recently there has been prepared for use of the office cards showing the evolution of the paragraphs of the Army Regulations, the Subsistence Manual, and the Army Transport Regulations. This work has required much care and attention and has already been found of the greatest convenience, and will in the future save time and search for the history of the paragraphs, which are so often under consideration.

Statistical tables are prepared and kept for ready reference, showing the average cost price in the United States of the leading food articles obtained from the important points of production and purchase, together with average prices of principal commodities furnished the army, as shown in the leading markets of the country. The information has been collected from various sources and may be considered as reliable.

There has been established at all post commissaries and other places where sales of subsistence stores are made a uniform system of records of money accountability. They include a new form of cash-book, cash sales book, sales ledger, cash sales slips, and charge slips. Detailed instructions are provided with each book. The method followed simply conforms to that in use in commercial life. Under this system when there is a change of the subsistence personnel at a post, the assignment or transfer of a commissary or commissary sergeant to another post, the same regulations and conditions will be found to

exist at the latter as at the post transferred from, and the work can be readily taken up and carried on without any difficulty or misunderstanding. The system will also facilitate the examination and verification by inspectors of the money accountability at different stations.

A scheme by which it is possible to eliminate the abstract of issues from paper accountability has been worked out, and it is expected that it can be put in operation before long, which will be a great saving in labor in this office, at posts, and elsewhere. The plan is that at the beginning of each month the current value of the ration—either garrison, travel, or Filipino—will be ascertained by computing the value of the component articles. For each ration period organizations will be given a credit at the commissary in an amount equal to the value of the number of rations to which they are entitled, as shown by ration returns submitted. They will then obtain from the commissary such articles kept on hand as they may desire, and will be charged therewith.

At the close of the month the accounts will be adjusted, and if there is a balance in favor of an organization, it will be paid the amount as savings; if the balance is in favor of the United States, the organization will pay the difference to the commissary.

A set of blanks is being prepared for use in the field, especially dealing with accountability where troops proceed beyond the advance depot. The intention is to simplify and reduce accountability in the field as much as possible, as it is considered that the business of such troops is to fight and not to make returns and do paper work.

DETAIL OF SUBSISTENCE OFFICERS TO FOREIGN SCHOOLS.

Through the courtesy of the British war office Maj. William H. Hart, commissary, was enabled to take the senior officer's course at the Army Service Corps School of Instruction at Aldershot, England. The course began in October, 1908, and lasted for seven months. This office highly appreciates the opportunity afforded an officer of the Subsistence Department to avail himself of the valuable instruction at the school, and appreciates the kindly and cordial manner in which he was received and treated upon all occasions during his residence at Aldershot.

Upon the recommendation of this office the French Government was requested to permit Capt. James A. Logan, jr., commissary, to take a course at the École de l'Intendance at Paris, from which all officers in the Corps de l'Intendance of the French army graduate. The school course commences in October of each year and lasts fifteen months. Captain Logan, upon direction of the Secretary of War, proceeded on July 1, 1909, to take temporary station at Paris, to be ready at the proper time to enter the school.

MILITIA.

Joint encampments of the Regular Army and Organized Militia were held during the earlier months of the fiscal year as follows:

Pine Plains, N. Y.—The States of Massachusetts, New Hampshire, Vermont, New Jersey, Pennsylvania, Connecticut, and Maryland participated. The total amount expended on account of the militia was \$9,095.55. At the encampment the State of Massachusetts defrayed its own expenses.

Camp William H. Taft, Ga.—The States of Virginia, North Carolina, South Carolina, Georgia, and Tennessee participated. The total amount expended on account of the militia was \$10,938.25.

Camp Emmet Crawford, Wyo.—The States of Wyoming, Colorado, and Utah participated. The total amount expended on account of the militia was \$2,705.78.

Fort Benjamin H. Harrison, Ind.—The States of Illinois, Indiana, Ohio, Kentucky, West Virginia, and Wisconsin participated. The total amount expended on account of the militia was \$16,507.69. At the encampment the State of Indiana defrayed its own expenses from allotment under section 1661, Revised Statutes.

Artillery district of Potomac.—The District of Columbia alone participated. The total amount expended on account of the militia was \$3,894.46.

Artillery district of Delaware.—The State of Delaware alone participated. The total amount expended on account of the militia was \$365.61.

Artillery district of Pensacola.—The State of Florida alone participated. The total amount expended on account of the militia was \$903.86.

Leon Springs, Tex.—The States of Arkansas, Louisiana, and Texas and the Territory of New Mexico participated. The total amount expended on account of the militia was \$6,692.41.

Fort Riley, Kans.—The States of Iowa, South Dakota, Kansas, and Oklahoma participated. The total amount expended on account of the militia was \$8,498.43.

Atascadero, Cal.—The State of California and the Territory of Arizona participated. The total amount expended on account of the militia was \$707.06. At the encampment the State of California defrayed its own expenses.

Camp David S. Stanley, Wash.—The States of Oregon, Washington, Idaho, Montana, and North Dakota participated. The total amount expended on account of the militia was \$9,890.67.

Joint army and militia coast defense exercises were participated in during May and June, 1909, in the Department of the East by the militia of Rhode Island and southern New York, and in the Department of the Gulf by the militia of Alabama and North Carolina. The amount allotted for expenses of the militia of Rhode Island was \$1,790 and of southern New York \$5,379.50, but this latter sum included the amount allotted for the expense of the militia of eastern New York also. The amount allotted to Alabama was \$492 and to North Carolina \$652.75.

During the year the militia of the District of Columbia were furnished in May, 1909, with 2,000 rations, costing \$420.94, and in June 1,700 rations, costing \$388.48, making a total amount of \$809.42, which sum was reimbursed to the Subsistence Department under section 1661 of the Revised Statutes as amended. Subsistence property was also furnished to the militia of the District of Columbia to the value of \$487.80, which sum was reimbursed to the Subsistence Department under the act of May 27, 1908.

Respectfully submitted.

HENRY G. SHARPE,
Commissary-General.

The SECRETARY OF WAR.

REPORT OF THE SURGEON-GENERAL.

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REPORT OF THE SURGEON-GENERAL.

WAR DEPARTMENT,
OFFICE OF THE SURGEON-GENERAL,
Washington, October 25, 1909.

SIR: I have the honor to submit herewith a report upon the work of the Medical Department of the Army, together with a financial statement for the fiscal year ending June 30, 1909, and a study of the health and sanitary conditions of the army for the calendar year 1908.

HEALTH OF THE ARMY.

OFFICERS.

The mean strength of officers was 3,637 as obtained from the returns of the Medical Department and 3,920 from The Adjutant-General.

There were 2,093 admissions, 19 deaths, and 106.98 constantly noneffective from all causes, equal to ratios of 575.47, 4.85, and 29.41; the ratio for admissions being lower than for any year since statistics have been compiled separately for officers. The death and constantly noneffective rates were slightly higher than for 1907.

The principal causes of admission in the order of their importance were influenza 50.04, diarrhea and enteritis 39.90, bronchitis 32.17, and malaria, 25.30.

Tuberculosis caused 2 deaths, typhoid fever 2 deaths, and chronic nephritis 2 deaths; no other disease caused more than 1 death. There were 6 deaths from accident.

OFFICERS RETIRED.

Fifty officers were retired on account of disability during the year, making a rate of retirement for disability of 12.76 per 1,000, by comparison with which it may be noted that the discharge rate for disability in enlisted men is 18.48. No officer was retired on account of wounds or injuries.

The following are the principal diseases for which retirements were made:

Organic diseases of the heart.....	8
Tuberculosis of lungs.....	6
Neurasthenia.....	5
Chronic nephritis.....	4
Enteritis, chronic.....	3
Dysentery, amoebic.....	2
Rheumatism, chronic.....	2
Locomotor ataxia.....	2
Cirrhosis of liver.....	2
Other diseases.....	16

TEST EXERCISES FOR FIELD OFFICERS.

In the report of this office for 1905 it was recommended that a progressive system of physical training under the supervision of medical officers should be adopted by the army, so that its personnel might be at all times physically fit for active service. This recommendation was approved by the Secretary of War, but has not thus far been carried into effect. Since that time an annual physical examination has been required for all officers of the army and a physical test in addition for those who have reached the grade of field officer. The object sought to be attained by this test is "a physical condition which would enable them to be always fit for active field service." It is believed that the present test not only fails in this purpose, but may result in serious damage to elderly officers. Its defect is that it requires officers to be fit only once a year. It is believed that officers should be required to be physically fit all the time, and as this can only be accomplished by constant physical training it is recommended that a certain amount of physical exercise be required of all officers at all times.

This is practically a very difficult problem to solve, especially in the case of staff officers and line officers doing office work at headquarters and other stations where there are no troops and no facilities for the proper care of mounts. The constant and unexpected changes of station to which officers are subjected under present service conditions also act as a material discouragement to the purchase of good private horses. It would seem, therefore, that the first step toward inducing field officers to ride regularly would be the providing by the Government of mounts and orderlies for them wherever they may be stationed as is understood to be customary for mounted officers in European armies. After such provision is made, a standard of physical fitness could be readily maintained either by monthly test rides or by requiring a certain minimum distance to be ridden monthly.

I concur in the suggestions made by General Barry in his report of April 1, 1909, that the test ride be modified in its requirements for those serving in the Tropics, and that for officers of 62 years or more the taking of the test ride be optional.

ENLISTED MEN.

During the year 1908 American troops were stationed in the United States proper, the Philippine Islands, Alaska, Hawaii, and Cuba, from which island the army of Cuban pacification was withdrawn during the months of February and March, 1909. Native troops served in Porto Rico and the Philippines.

Statistics for the native troops—Porto Rican and Filipino—have been separately compiled, and when reference is made to the "Army" in this report the American Army proper, white and colored troops, is meant.

As in many diseases, notably the venereal and malarial, the same soldier is often admitted several times on account of the same case of illness, the total number of admissions is necessarily considerably greater than the actual number of cases. The extent of this discrepancy for diseases and injury is 6.77 per cent.

The mean enlisted strength of the army, American troops, white and colored, for the year 1908, as reported on the monthly sick reports of the Medical Department, was 65,406, and on the returns of The Adjutant-General's office 67,515. The former represents the strength of the commands from which the sick returns were made and was used in calculating all ratios except those for deaths and discharges. As all deaths and discharges were reported, even of those absent from a command, the total strength as obtained from The Adjutant-General was used in calculating ratios pertaining to those headings. This shows a considerable increase in strength over the year 1907, for which the medical returns showed 53,803 and The Adjutant-General's office 54,949.

CONSTANTLY NONEFFECTIVE RATE.

The constantly noneffective rate, which is the true measure of the loss in efficiency of the army from sickness and injury, was 42.68 per 1,000, as compared with 46.17 for 1907 and 49.79 for 1906.

TOTAL ADMISSIONS TO SICK REPORT.

The total number of admissions to sick report was 77,704, equal to an admission rate of 1,188.03, as compared with 1,218.26 for the previous year and 1,706.33 for the preceding decade.

DEATHS FROM ALL CAUSES.

The deaths from all causes number 414, of which 235 were from disease. The death rate for all causes was 6.13 and 3.48 for disease, as compared with 5.81 and 3.44, respectively, for the preceding year.

DISCHARGES FOR DISABILITY.

The discharges for disability numbered 1,248, the rate being 18.48, as compared with 20.15 for 1907.

Gunshot wounds caused 188 admissions, with 56 deaths and 33 discharges.

Wounds other than gunshot (contused, lacerated, incised, and punctured) caused 3,439 admissions, with 6 deaths and 16 discharges.

Drowning caused 48 deaths, poisoning (acute) 29, and freezing 3. There were no deaths from sunstroke during the year. The American troops suffered no loss of killed or wounded in action during the year.

There were 39 suicides and 22 homicides.

ADMISSION RATES FOR DISEASE.

A comparison of total admission rates for diseases for the two past decades, shows a marked increase in sickness due to the exposures to tropical climates and conditions consequent upon the occupation of new territory during and since the Spanish-American war. It also shows a steady diminution in sickness after the first year of colonial expansion in 1898, with the rapid advance of our knowledge of tropical diseases and preventive medicine and the establishment of more sanitary conditions of living in our tropical possessions.

The progressive improvement since 1898 has been due chiefly to sanitary control of the infectious fevers—malarial, typhoid, and yellow

fever. It would be even greater than at present if it had not been offset to a considerable extent by the formidable increase in the venereal diseases and tuberculosis.

VENEREAL DISEASE.

Venereal diseases show a slight diminution as compared with last year, but in admission rate, 194.13, and constant noneffective rate, 11.65, they still far outnumber any other disease group. They must, under our present sociological conditions and in view of the popular opposition to taking preventive measures against this special class of infectious diseases, be considered largely nonpreventable diseases so far as sanitary measures are concerned.

TUBERCULOSIS.

The increase in tuberculosis during the last decade, although not large in the number of cases as compared to other diseases, is important by reason of the high death and discharge rates of this disease and its long duration. The reasons for this increase and the steps appropriate to check it will be discussed later.

The admission rate for tuberculosis was 4.51, as compared with 5.15 for 1907, and the discharge and death rate taken together, 3.03, as against 3.75 for 1907.

MALARIA.

The great and gratifying diminution in malarial infection in recent years has been maintained this year, the admission rate having fallen from 107.67 in 1906 to 63.19 in 1907 and 46.33 in 1908. Malaria has this year dropped from the second place in number of admissions, which it held last year, to the third place, diarrhea and enteritis being this year second to venereal diseases, with an admission rate of 53.27, compared with 49.26 for last year.

All the deaths and discharges which occurred in the United States of troops invalided home from foreign service and whose organizations remained abroad have been assigned to the country from which the soldiers were invalided. There yet remains, however, a large number of deaths and discharges which can only be assigned to the place where they occur, though the diseases which led to these terminations were contracted in foreign service.

Alaska has, as in the preceding years, the lowest rates for admissions, discharges, and constantly noneffective; its death rate for disease being next to Cuba, which has the lowest. Cuba had also the lowest total death rate. In admission rate the United States was next greater than Alaska, while in its constantly noneffective rate it was larger than Alaska, Hawaii, and Cuba, but better than the Philippine Islands.

The Philippine Islands had the largest rates for total admissions, constantly noneffective, and deaths from all causes.

INFLUENCE OF ARM OF SERVICE.

In these comparisons the enlisted men of the Ordnance Department and Signal Corps are not considered on account of their small number and the special character of their services.

The admission rate was highest in the cavalry and lowest in the Hospital Corps; the death rate was highest in the Engineers and lowest in the Coast Artillery.

The following table shows the relative frequency of occurrence of the more important diseases for the various arms of the service. The figure 1 indicates highest ratio, and 6 the lowest, in each case for each arm.

Arms of service.	More important diseases.											
	Veneral diseases.	Tonsillitis and pharyngitis.	Diarrhea and enteritis.	Malaria.	Bronchitis.	Alcoholism.	Rheumatism.	Dysentery.	Tuberculosis, all forms.	Typhoid fever.	Pneumonia.	All injuries.
Cavalry.....	2	2	1	1	3	5	3	4	4	1	6	1
Field Artillery.....	3	1	5	2	5	6	2	5	5	5	2	2
Coast Artillery.....	5	5	4	5	1	1	4	6	3	4	5	3
Infantry.....	1	3	2	4	4	4	1	1	2	2	3	5
Engineers.....	4	4	3	3	2	2	5	3	6	6	4	4
Hospital Corps.....	6	6	6	6	6	3	6	2	1	3	1	6

INFLUENCE OF RACE.

All the rates, except those for discharges for disability, were higher for colored than for white troops, the death rate being more than twice as great.

The admission rate for venereal diseases was nearly double for the colored race and less than one-third for Filipinos as compared with the white race. Malarial fever was one-third more frequent for the colored race and five times more frequent for the Filipinos than for whites, an incidence which is somewhat surprising in view of the supposed relative immunity of the dark races to this infection. It is true, however, that a much larger proportion of Filipino than of white or colored troops were stationed in malarious localities, and they were probably not so carefully protected from mosquitoes.

Next to malarial fevers, beriberi was the most prevalent disease among Filipino soldiers with an admission rate of 121.53, while only one case of this disease occurred among white troops and none among colored.

The incidence of tuberculosis was greatest in the colored race, next in the Filipino and least in the white race; and the same was true of dysentery and cholera.

COMPARISON WITH FOREIGN ARMIES.

There are so many factors which are peculiar to each country that an accurate comparison of our statistics with the data available in the annexes of the annual reports of the medical departments of the armies of a number of foreign governments is impossible. For example, in most foreign services many of the minor ailments, which in the United States Army are treated in quarters and recorded with the same accuracy and care as the hospital cases, are not made of record in the medical reports. As an instance in point it may be noted that the admission for alcoholism in the United States is nearly 22

times that of the British army, but the death rate for alcoholism in the latter is one-half that in our army. The admission rates for alcoholism and the venereal diseases taken together are much higher in the United States Army than in any of the foreign armies. This is also true of the separate venereal diseases, with the exception of syphilis, for which the admission rate is 39.3 in the British army as compared with 23.1 in our army. For malaria, the admission rate as compared with the United States is higher in the British, Russian, and Spanish, and much lower in the French, Prussian, Bavarian, Austro-Hungarian, and Belgian armies. Pulmonary tuberculosis is higher in the French, Dutch, Spanish, and Belgian armies and lower in the British, Prussian, Bavarian, and Austro-Hungarian. In the three last named the ratio is identically the same, being 1.4.

For typhoid fever the admission rate is higher in the British, French, Russian, and Spanish armies.

The death rate for the American Army is greater than any other, but the total loss rate, which is the sum of the deaths and discharges, is less than any except the British and Belgian. The admission rate is higher than any other except the Dutch. This is probably due, as explained above, to the rule in our service of recording all cases of sickness, while in the foreign services the lighter cases are not recorded.

The death rate for our service is increased also by the custom of retaining on sick report for treatment many cases of tuberculosis and other diseases, which in foreign armies are discharged, thus giving them a lower death rate and a higher discharge rate.

SURGICAL OPERATIONS.

In 3,467 operations there were only 21 failures and 31 deaths. The anesthetic used was ether in 965 cases, chloroform in 497, and spinal anesthesia in 9. There was 1 death from anesthesia.

One hundred and ninety-six operations were performed for appendicitis, with 6 deaths; 181 operations for hernia, with 1 death; 16 exploratory laparotomies, with 2 deaths; and 22 operations for abscess of the liver, with no deaths.

RECRUITING.

No recruit is now enlisted without a thorough physical examination by a medical officer of the army. The increased size of the army has caused a large increase in the number of recruits examined by medical officers during the year 1908, the total number being 54,885 as compared with 33,864 for the preceding year. The movement of recruits is shown in the following table:

	White.		Colored.		Total.	
	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.
Examined by medical officers.....	52,740	1,000.00	2,145	1,000.00	54,885	1,000.00
Accepted by medical officers.....	44,566	845.01	1,915	892.77	46,481	846.88
By first enlistment.....	29,136	552.45	688	320.74	29,824	543.39
By all other enlistments.....	15,430	292.56	1,227	572.03	16,657	303.49
Rejected by medical officers.....	7,218	136.86	216	100.70	7,434	135.45
Declined.....	956	18.13	14	6.53	970	17.67

* Of this number 740 (725 white and 15 colored) were rejected for causes not physical.

This represents only the applicants who had previously passed the scrutiny of the recruiting officers, and who were therefore picked men. The number of examinations and of rejections by recruiting officers is not known to this office, but was of course much larger. The present system operates in a highly satisfactory manner and furnishes to the army recruits of excellent quality.

The following table shows the nativity of accepted recruits for the year:

Country.	White.		Colored.		Total.	
	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.
United States.....	37,636	844.50	1,915	1,000.00	39,551	850.91
Germany.....	1,372	30.79			1,372	29.52
Ireland.....	1,202	26.97			1,202	25.86
Russia.....	1,045	23.45			1,045	22.48
Austria.....	669	15.01			669	14.39
England.....	538	12.07			538	11.57
Canada.....	422	9.47			422	9.08
Scandinavia.....	367	8.24			367	7.90
Hungary.....	295	6.62			295	6.35
Italy.....	269	4.69			269	4.50
Denmark.....	180	4.04			180	3.87
Scotland.....	123	2.76			123	2.65
Roumania.....	104	2.33			104	2.24
Switzerland.....	98	2.20			98	2.11
Holland.....	77	1.73			77	1.66
France.....	53	1.19			53	1.14
Turkey.....	44	.92			41	.88
Greece.....	32	.72			32	.69
Spain.....	16	.36			16	.34
Others.....	87	1.95			87	1.87
Total foreign.....	6,930	155.50			6,930	149.09
Grand total.....	44,566	1,000.00	1,915	1,000.00	46,481	1,000.00

The number of foreign born recruits is somewhat greater than last year, the ratio being 149.09 as compared with 134.10. The proportionate number from Ireland has increased while that from England has diminished as compared with last year, the ratios for Scotland and Canada remaining about the same. The most noticeable change as compared with the preceding report is the increasing number of Russians; the number accepted in 1908 being 1,045 as compared with 413 for 1907, the ratios being 22.48 and 13.76. While this nationality now stands third in the number of recruits furnished, it stands first in the number of men discharged from the service upon surgeon's certificates of disability. Twenty-seven soldiers of Russian nativity were discharged for disability, which equals in number those of German and Italian birth taken together so discharged.

Of the white recruits 45.77 per cent were 5 feet 8 inches or over, and 8.97 per cent were 5 feet 4 inches or under, compared with 46.73 and 8.32 per cent for the previous year. For colored troops, 44.18 per cent were 5 feet 8 inches or over, and 8.51 per cent 5 feet 4 inches or under, compared with 47.54 and 7.08 per cent for the preceding year.

The average height for white recruits was 5 feet 7.4 inches; for colored, 5 feet 7.3 inches.

The average weight of white recruits was 142.9 pounds; of colored recruits 148.6 pounds.

Fifty-four and twenty-one one-hundredths per cent of the white troops weighed 140 pounds or over, while 2.04 per cent weighed less

than 120 pounds, as compared with 55.74 and 2.61 per cent for the previous year. Sixty-nine and four-tenths per cent of the colored troops weighed 140 pounds or over, and only 0.68 per cent less than 120 pounds, compared with 71.84 and 0.27 for 1907. The colored recruits were heavier than the white recruits of the same age.

The chest measurement of 45.74 per cent of white recruits was 34 inches and over, and 3.41 per cent were 30 inches and under, compared with 41.25 and 4.23 per cent, respectively, for the previous year. The chest measurements for colored recruits show 57.44 per cent 34 inches or over, and 2.24 per cent 30 inches and under, compared with 53.54 and 2.36 per cent, respectively, for 1907, the colored candidates again showing to advantage.

The following table shows the causes of rejection among white and colored candidates examined for enlistment during the year 1907, with ratios per 1,000 rejected:

Causes of rejection.	Total.		White.		Colored.	
	Number.	Ratio per 1,000 of all rejections for causes, physical and mental.	Number.	Ratio per 1,000 of all rejections for causes, physical and mental.	Number.	Ratio per 1,000 of all rejections for causes, physical and mental.
Diseases of the eye, including defects of vision...	723	108.01	702	108.12	21	104.48
Veneral diseases.....	714	106.66	670	103.19	44	218.91
Diseases of the ear, including defects of hearing..	617	92.17	608	93.64	9	44.78
Heart disease.....	589	87.99	570	87.79	19	94.53
Flat feet.....	388	57.96	375	57.75	13	64.68
Alcoholism.....	378	56.47	369	56.83	9	44.78
Under weight.....	296	44.22	289	44.51	7	34.83
Defective teeth.....	295	44.07	292	44.97	3	14.93
Hernia.....	284	42.43	277	42.66	7	34.83
Chest development insufficient.....	259	38.69	257	39.58	2	9.95
Defects of development, except as shown in detail.	219	32.72	214	32.96	5	24.88
Diseases of the respiratory system.....	201	30.03	194	29.88	7	34.83
Diseases of the skin.....	198	29.58	191	29.42	7	34.83
Curvature of the spine.....	197	29.43	189	29.11	8	39.80
Diseases of the genito-urinary system, nonvenereal.....	192	28.68	184	28.34	8	39.80
Varicose veins, except as shown in detail.....	176	26.29	169	26.03	7	34.83
Injuries.....	174	25.99	174	26.80	.....	.....
Diseases of the organs of locomotion, except spinal curvature.....	157	23.45	152	23.41	5	24.88
Tuberculosis.....	132	19.72	127	19.56	5	24.88
Varicocele.....	87	13.00	86	13.25	1	4.98
Hemorrhoids.....	74	11.05	71	10.93	3	14.93
Diseases of the digestive system, except as shown in detail.....	69	10.31	68	10.47	1	4.98
Diseases of the nervous system, except as shown in detail.....	63	9.41	59	9.09	4	19.90
Weakness of mind.....	47	7.02	45	6.93	2	9.95
Overweight and obesity.....	44	6.57	43	6.62	1	4.98
General diseases, except as shown in detail.....	42	6.27	40	6.16	2	9.95
Underheight.....	35	5.23	34	5.24	1	4.98
Diseases of the circulatory system, except as shown in detail.....	29	4.33	29	4.47	.....	.....
Physical debility.....	12	1.79	12	1.85	.....	.....
Over height.....	3	.45	3	.46	.....	.....
Rejected for causes, physical and mental..	6,694	1,000.00	6,493	1,000.00	201	1,000.00
Rejected for causes not physical or mental.	740	.....	725	.....	15	.....
Total.....	7,434	.....	7,218	.....	216	.....

Diseases of the eye, including defects of vision, caused the largest proportion of rejections, as was the case last year, although the ratio for this cause was considerably less. Venereal diseases were again second, and diseases of the ear, including deafness, third. The ratio

per 1,000 of rejections for venereal disease for the colored race were more than double that for the white, while for diseases of the ear, including deafness, their ratio was less than half that of the whites.

DISCHARGES FOR DISABILITY.

Soldiers belonging to organizations stationed outside the territorial limits of the United States are customarily sent to San Francisco for discharge. The discharge rate for all causes has shown a steady and gratifying diminution since 1906, when the system of recruiting was so modified as to require every recruit to be examined by an officer of the Medical Corps. The recent establishment of additional recruit depots at Fort Logan and Benicia Barracks will permit of holding recruits somewhat longer under observation and may thus be expected to still further eliminate applicants having concealed disqualifications. In this way the discharges for causes existing prior to enlistment may be expected to be still further reduced in the future.

The total disability discharge rate for 1908 is 18.48, as compared with 20.15 for 1907 and 26.00 for 1906. The principal causes for discharge during the year were tuberculosis, ratio 2.50; venereal diseases, ratio 2.33; and insanity, ratio 1.05. These diseases hold the same relative positions as last year, but the ratios are considerably lower.

EXAMINATION AND OBSERVATION OF RECRUITS.

A very thorough investigation of the system of examination and observation of recruits in vogue at the recruit depots of Fort Slocum, Columbus Barracks, and Jefferson Barracks was made during the year in consequence of an expression of opinion by the chief surgeon, army of Cuban pacification, that there were too many discharges from that army for disability which existed prior to enlistment, which it seemed a careful examination should have disclosed. Twenty-two discharges were reported by him as made between June 30 and September 30, 1908, for causes existing prior to enlistment. The investigation, which was painstaking and thorough, showed that in some cases the disability had developed since enlistment and in others—such as cases of epilepsy, chronic alcoholism, latent syphilis, and defective mental development—no manifestations of the disqualification appeared during the stay of the recruit at the depot, which was frequently, on account of the necessities of the service, much briefer than was desirable. The Surgeon-General, in reviewing the voluminous report of this investigation, expressed himself as follows:

In conclusion, it is believed that the medical officers on duty at the recruit depots are doing work of a very high order and are accomplishing all that can be expected of them in the detection and elimination of those unfit for military service. This opinion is sustained by the marked decrease in the number of discharges for disability in the army since the new system of recruiting has gone into operation, and also by the greatly diminished number of complaints received at this office as to the inferior character of recruits.

UNITED STATES (CONTINENTAL) EXCLUSIVE OF ALASKA.

The average mean strength of the troops serving in the United States was 46,316, of which 45,592 were white and 724 were colored.

Deaths and discharges of soldiers which occurred in the United States, they having been invalided home from their commands in foreign service, have been charged to the country where such commands are stationed. The admission, discharge, death, and constantly noneffective rates are all lower than those of last year or 1906.

The remarkable diminution of the discharge rate since it has been required that all recruits shall be passed upon by a medical officer is very gratifying. This rate was for 1906, 33.88; for 1907, 25.36; for 1908, 21.35; being a diminution of 37 per cent in two years. The venereal diseases were as usual in the lead, both in the admission and constantly noneffective rate. For admissions, next in importance were diarrhea and enteritis, 46.49; influenza, 40.98; and bronchitis, 36.21. In order of their constantly noneffective rates, which constitute the real test of their effect in military efficiency, the order is tuberculosis, 3.02; measles, 0.88; bronchitis, 0.74. The most important cause for discharge was tuberculosis, with venereal diseases second.

Pneumonia was the principal cause of death, with tuberculosis second and typhoid fever third, while for the preceding year cerebrospinal fever led, with tuberculosis second and pneumonia third. The total number of deaths was 257, of which 108 were from external causes, 25 of them being suicides and 72 accidental.

PREVALENCE OF SPECIAL DISEASES.

TYPHOID FEVER.

The number of cases of typhoid fever which occurred during the year within the geographical limits of the United States was 136.

The admission and death rates for this disease were 2.94 and 0.23, respectively, the former being the lowest for any year of record in this office. The case mortality was 8 per cent, this and the death rate being higher than for last year, when they were 5.6 and 0.19, respectively. The ratio of incidence for white troops was 2.96 and for colored troops 1.38.

The following comparative table shows the most important variations in the occurrence of this disease for the present year as compared with 1907:

Post.	1907.	1908.
Fort Sam Houston, Tex.....	16	2
Fort Leavenworth, Kans.....	12	3
Fort Wingate, N. Mex.....	0	8
Fort Des Moines, Iowa.....	3	10
Fort Thomas, Ky.....	7	2
Fort Walla Walla, Wash.....	5	0
Fort Slocum, N. Y.....	6	1
Columbus Barracks, Ohio.....	10	6
Fort Oglethorpe, Ga.....	4	0
Fort Robinson, Nebr.....	2	5
Fort Riley, Kans.....	2	5
Fort Monroe, Va.....	4	6

It will be observed in this table that none of the posts which showed any considerable occurrence of this disease in 1907 had many cases during the last year except Columbus Barracks. This post being a

recruiting depot, receives a large number of transients from the neighboring States, and so it may be expected to furnish a considerable number of cases from sources of infection outside the post.

The greatest number of cases during the past year occurred at Fort Des Moines, Iowa. The cases were not confined to any one organization, and only four occurred in any one month. The source of infection was not discovered in any case, but the surgeon was inclined to attribute it to the use of beverages cooled with natural ice.

Fort Wingate, N. Mex., had the next greatest number, with eight. Of these, seven occurred in the month of October soon after the arrival of the men at this station; the source of infection, therefore, seems to have been outside of the post. The infection at Fort Riley, Fort Robinson, West Point, and Fort Myer is ascribed to sources outside the posts, while for that at Fort Monroe no explanation has been received.

During the summer of 1908 Maj. F. F. Russell, Medical Corps, was sent to Europe to make a study of the methods in use in England for the prevention and stamping out of typhoid fever epidemics, both in the army and among the civil population. His investigations were conducted with great industry and ability, and his report is a very valuable treatise on the epidemiology of this disease up to date, and concludes with a programme for a preventive campaign against this disease in the military service.

This report and his recommendations were then submitted to a board of eight medical officers, of which the Surgeon-General was president and Major Russell recorder. The other six were distinguished members of the Army Medical Reserve Corps on the inactive list, and the assembling of this board is notable as the first occasion upon which the services of members of the Reserve Corps of great distinction in their profession have been employed in behalf of the army. These members were:

Dr. Victor C. Vaughan, dean of the department of medicine and surgery, University of Michigan.

Dr. William T. Councilman, professor of pathology, Harvard University.

Dr. John H. Musser, professor of clinical medicine, University of Pennsylvania.

Dr. Alexander Lambert, professor of clinical medicine, Cornell University, New York.

Dr. Simon Flexner, director of laboratories, Rockefeller Institute for Medical Research.

Dr. William S. Thayer, professor of clinical medicine, Johns Hopkins University, Maryland.

The board proceeded to review the history of vaccination as a method of protecting troops against typhoid fever. The experience of both the English and the German armies was considered.

The theory on which the practice is based as well as many details involved in carrying out the procedure were considered, as was also the probable effect on the medical profession and the public at large in the United States.

As a result of several hours discussion the board adopted, without any dissenting voices, the following conclusions:

I. The board is convinced that the practice of antityphoid vaccination is both useful and harmless and that it offers a practicable means of diminishing the amount of typhoid fever in the army both in times of peace and war.

II. It finds that the experience to date with antityphoid vaccination justifies it in recommending the introduction of the practice in the Regular and Volunteer armies in time of war.

III. It recommends the immediate introduction of the practice of voluntary vaccination against typhoid in the Hospital Corps, the Army Nurse Corps, and in any expedition of troops from the Regular Army which is ordered to take the field for active operations; and further, that an opportunity be given to volunteers from the army as a whole to be protected by vaccination against typhoid.

There being no further business before it, the board adjourned *sine die*.

This office immediately proceeded to carry out the recommendations of the board by calling the attention of the chief surgeons to the above conclusions which were published in G. O. No. 10, W. D., 1909, and directed them to inform all medical officers that vaccin could be procured from the laboratory of this office, and that it was desirable to begin inoculations upon members of the Hospital Corps and Army Nurse Corps and such other persons connected with the army as volunteered, although the intention at this time is not to make an energetic campaign outside the Medical Department. Their attention was called to the fact that Leishman, in a recent report published in the Journal of the Royal Army Medical Corps, gave the following results of typhoid vaccinations: 5,473 men were vaccinated, of whom 21 had typhoid and 2 died. Among these 21, only 2 had had a second dose of the new vaccin, and these recovered. Three of the 4 were noted as extremely mild, and the diagnosis of typhoid in one of them was doubtful. Among the same organizations 6,610 were not vaccinated, and of these 187 developed typhoid fever and 26 died.

As soon as possible after this board had reached its favorable decision preparations were made at the Army Medical School to manufacture the vaccine in large quantities. A special room in the Army Medical Museum was fitted up as a vaccin laboratory. It was furnished with a complete equipment of entirely new apparatus, specially planned for this particular purpose. The room is in a different part of the building from the general quarters of the Army Medical School and is so arranged that an interchange of material and glassware is impossible between the two divisions. Everything essential to the making of the prophylactic is found in this laboratory, and no work of any other kind is done there. These provisions make it possible to produce a vaccin the purity of which is beyond suspicion. The capacity of the laboratory is now about 3,000 doses daily, but with a slight increase in the number of assistants this quantity can be doubled. In February the laboratory was completed and a considerable quantity of vaccin was ready for use by the end of that month. The immunization of volunteers in the city of Washington was begun by the 1st of March, and as the immediate results were completely satisfactory the vaccination of the Hospital Corps and of all others who volunteered was taken up soon afterwards.

The response to the call for volunteers was prompt, and a comparatively large proportion of the Hospital Corps and many others from the line of the army requested the treatment. Up to the present time, September 4, 1909, the number volunteering has been over

1,300, and sufficient vaccin for that number has been sent out. A suitable number of record cards and the following circular of instructions is furnished with each package of vaccin:

By direction of the Surgeon-General, a package containing —— tubes of anti-typoid vaccin has been sent you.

The dose is 0.5 c. c. for the first vaccination and 1 c. c. for the second, to be given ten days later; a third dose of 1 c. c. should be given after another interval of ten days.

The site of the inoculation is the arm at the insertion of the deltoid muscle. The dose is to be given subcutaneously, and not into the muscles nor into the skin. The arm should be cleaned as for any other operation. After the vaccin has been injected it is well to disinfect the needle puncture by touching it with a minute quantity of pure phenol or liquor cresolis comp., U. S. P. It is also suggested that you massage the injected area for a few minutes through a piece of sterile gauze.

The glass container should be washed off in an antiseptic solution and opened after making one or more cuts near the top with a file. The vaccin can be drawn out of the container with the syringe, or it may be emptied into a salt-cellar which has been sterilized by boiling.

The syringe and needles should be sterilized by boiling in 2 per cent soda solution. To insure perfect sterilization, draw the piston out to its full length, or remove it entirely, so that the barrel is full of water during the boiling. A fresh needle must be used for each man, or, if the same be used, it must be plunged into boiling soda solution to resterilize it.

The most suitable time for administration of the vaccin is about 4 o'clock in the afternoon, as the greater part of the reaction is then over before morning.

No applicant should be vaccinated who is not perfectly healthy and free from fever at the time, and it is advisable, in case of doubt, to take the temperature and to examine the urine; in the case of any man who has fever or any other signs of illness it should be postponed until he recovers. This precaution is necessary to avoid the vaccination of men who might be coming down with typhoid.

The men should be cautioned not to drink beer or liquor on the day of treatment.

The vaccin has been tested on human beings, and has produced, as a rule, a mild general reaction, although occasional severe responses occur. There is usually some headache and malaise, and a local reaction consisting of a red and tender area about the size of the palm of the hand, and sometimes tenderness in the axillary glands. The entire reaction is over in forty-eight hours, and it seems best for the present not to require any duty for that period, nor to permit any active exercise such as long rides or walks. Some individuals may be very susceptible and develop a severe general reaction (headache, backache, nausea, vomiting, herpes labialis, and rarely albuminuria, and some loss of body weight). The number of severe reactions has been exceedingly small, and regardless of their severity they all disappear completely inside of forty-eight hours. No untoward results of any kind have ever been noted. If any severe reactions occur among your men, you are desired to report upon them in detail.

For every man inoculated a card must be filled out and sent to this office for file. A duplicate is to be retained at the post as part of the roster of men immunized against typhoid. Blanks are inclosed, and more will be furnished on request to this office. When the man changes station it should be forwarded to the surgeon at the new post. This is in addition to and quite separate from the cards required for all men on sick report. In filling out the record card it is not expected that the temperature of every man will be taken; many of the men will have no special symptoms and will not report to the surgeon unless directed to do so, and the reaction in such cases can be set down as none or mild, according to the history. It is, however, desired that the temperature of all men who report sick be taken and recorded.

Any vaccin remaining unused should be thrown away and a fresh vial opened for each day's vaccinations. It should be stored in the ice box.

Three doses undoubtedly give better protection than two, and while we can not hope to give the third dose to every man, it is expected that an effort will be made to administer it to as many as possible.

An interval of ten days between doses has been adopted, because experience shows that nothing is gained by giving the doses closer together. The production of large quantities of specific anti-bodies does not become evident until about eight to ten days after vaccination; the second dose is therefore not given until the first has become effective, since there may be a temporary fall in the quantity of protective bodies present in the serum after the administration of the second and third doses. We do not believe that there is any increased susceptibility following the first dose, but that increased resistance begins immediately, although the degree of immunity produced is not very high until after the lapse of ten days. Ten days between doses

is therefore the minimum interval. If it is not convenient to give the second dose at the regular time it may be postponed up to the fourteenth day, but it is not well to wait longer than this if good results are to be obtained.

We are frequently asked as to the duration of the immunity following vaccination. It is impossible to give an exact answer to this question, but there are some reasons for believing that it will last as long as the immunity acquired by an attack of typhoid fever. We find, for instance, that there is a much larger amount of some anti-bodies found in the serum after vaccination than after clinical typhoid.

If a man has been immunized by three doses, will it ever be necessary for him to take another course? Our experience with vaccination against smallpox has shown the wisdom of revaccination on exposure to the disease, and I think we may say that it would be wise to be reimmunized before going into a place where typhoid is epidemic.

The vaccin is well borne by larger children and by women, and it can be administered in doses proportioned to the body weight, taking one hundred and fifty pounds as the unit. Women should not be vaccinated during or near the time of menstrual period.

The vaccin will keep for six months and perhaps longer when it is stored at low temperature in the dark, but it is our plan to make most of it to order, and to administer it as soon after its preparation as is consistent with complete and thorough tests of its purity and sterility.

Completed record cards have been received from 830 individuals, distributed as follows: Officers, 127; noncommissioned staff, 2; Hospital Corps, 444; Coast Artillery Corps, 104; infantry, 99; civilians, male 22, female, 12; children 20. The comparatively large number of officers who have availed themselves of this method of protection is noteworthy. They constitute 15 per cent of the total number vaccinated, although they represent only 5.3 per cent of the authorized strength of the army. The distribution among the officers of the various branches of the service is as follows: Medical Corps, 85; infantry, 30; field artillery, 2; cavalry, 2; Engineer Corps, 2; Quartermaster's Department, 1; General Staff, 2; retired officers, 2. Their influence is further shown by the fact that most of the 54 civilians vaccinated are officers' children or other members of their families.

The total number of doses administered has been 2,242. An effort has been made to give three doses to as large a number as possible, and it is gratifying to be able to report that over 75 per cent have had this number. The number receiving two doses was 20 per cent, and those receiving only one dose was 5 per cent. Very few have refused to take the third, and fewer the second dose, but change of station and other incidents of the service are responsible for the failure of one-fourth of the volunteers to receive the full protective treatment. No untoward results of any kind have been reported in this comparatively large number of vaccinations.

The reaction following vaccination has already been described in a general way in the circular letter of instructions quoted above. Our experience to date has been that 92.1 per cent of the vaccinations produced no general reaction at all, or only a mild one; 6.6 per cent were of moderate severity; and only 1.2 per cent were severe. These figures show that the chances of being incapacitated for forty-eight hours after vaccination are quite small.

The amount of protection given by the vaccination, as judged by the quantity of specific protective anti-bodies in the patients' serum is very considerable, and in some ways it exceeds the quantities found after recovery from an attack of typhoid fever. This leads us to believe that the duration of the immunity will last for a considerable time. The procedure has been introduced so recently that it is not

possible to form any very exact idea of the protection given from statistics showing the morbidity and mortality from typhoid, but it is at least interesting to note that no cases of fever have appeared among the 830 who have been treated, although they have been exposed equally with the rest of the army.

There has been no opposition or objection of any sort to this procedure, and it is felt that it has now successfully passed the introductory stage and that its use should be rapidly extended, not only among the Hospital Corps but also to include the vaccination of volunteers from all organizations about to depart for duty outside of the United States proper, and among troops who may be ordered on extended practice marches or maneuvers.

LABORATORY INVESTIGATION OF OUTBREAKS.

At the same time it was determined to make arrangements for the systematic study of outbreaks of this disease in the army in order to facilitate the early diagnosis of the disease and detection of typhoid bacillus carriers and the period at which convalescent cases ceased to be infective and may be safely returned to duty. Arrangements were made so that the necessary bacteriological examinations could be made at the laboratory of the Surgeon-General's office in Washington, and at laboratories established in connection with the Post Hospital at Fort Leavenworth, Kans., and the General Hospital, San Francisco, Cal., and also in the laboratory for the board for the study of tropical diseases at Manila.

The following instructions were issued to post surgeons through chief surgeons of the departments:

In all cases of fever which possibly may be typhoid, and in which the diagnosis is in doubt, specimens of blood should be sent promptly by mail to the nearest laboratory with request for a bacteriological diagnosis. Experience has shown that the diagnosis of typhoid fever may be made by blood cultures much sooner and with greater certainty than by the Widal test.

Specimens of feces and urine from suspected typhoid carriers should also be sent to the laboratory for examination and report.

Hereafter no case convalescing from typhoid fever will be returned to duty until three negative reports on samples of urine and feces, collected at six-day intervals, have been made.

Every case of typhoid, or suspected typhoid, at a post will be reported at once by information slip to the chief surgeon of the department and a duplicate sent to the Surgeon-General.

Any typhoid patient who is not suffering from a relapse, and who continues to excrete typhoid bacilli after ten weeks from the beginning of his fever, should be reported to the chief surgeon of the department.

Suitable containers for urine, feces, and blood for the tests, with full directions for collecting the same, may be obtained from the nearest of the designated laboratories.

Besides investigations connected with typhoid fever, these laboratories will also, upon request, conduct other bacteriological investigations connected with infectious diseases.

It is the intention of this office to utilize the laboratories established at the General Hospital, San Francisco, Cal., and at Fort Leavenworth, Kans., for the examination of the water supplies of posts for which they are respectively the nearest laboratory, it having been found that the bacteriological examinations in Washington of water shipped from the far western States is unsatisfactory on account of the length of time elapsing between the collection and examination. It is, of course, understood that where the facilities for bacteriological examinations of excreta exist at the posts they are made on the spot.

An opportunity was soon given to put into practice this method by the outbreak of an epidemic of typhoid fever at Fort Niagara, N. Y., where 16 cases appeared between January 7 and March 7, 1909. The garrison consisted of four companies of the Twelfth Infantry, about 365 officers, men, and civilians. The investigation of this outbreak was made by Maj. Charles F. Mason, Medical Corps, from this office, who makes the following report of his investigation:

Thirteen cases occurred in K Company between February 9 and 24, after which there was an interval of twelve days and then 1 more case.

The first 2 cases in Companies I and M may be considered sporadic, and were probably the result of drinking polluted water from the Niagara River, either at Niagara Falls, where Private D. was on furlough from December 12 to 20, or from the taps at the post.

The outbreak in K Company was distinctly a company epidemic. The tap water of the post may be excluded as a cause, because it is supplied to the whole post, while all the cases except 2 occurred in K Company.

Milk may be excluded for the same reason, and because only 4 of the typhoid patients admitted having used it at all. Raw shellfish had been used by only 1 of the patients and raw fruit or vegetables by none.

Six of the patients had not been absent from the post at any time within a month preceding their illness. Most of the others had been in Niagara Falls for at least a few hours during that period.

A careful laboratory examination of the blood, urine, and feces of all the members of K Company showed 9 men who had not been on sick report and whose blood gave a positive Widal reaction. One of this group also had typhoid bacilli in his feces on a single examination. This last man, Private R—1, denies ever having had typhoid fever. Two others admitted having had typhoid several years ago.

Neither the cooks of K Company gave a positive reaction to any of the laboratory tests.

Private R., of K Company, whose blood gave a positive Widal reaction and whose urine contained typhoid bacilli, had been on duty in the company mess very nearly a year. During this time he handled the dishes and food used by the men of the company.

Private R—1 of K Company, whose blood gave a positive reaction and whose feces showed the presence of typhoid bacilli, was the company barber.

Privates D., M., and R. did duty as kitchen police after having been returned to duty from hospital following the attacks of so-called "influenza."

In my opinion the infection of the members of K Company was by a carrier or carriers. Private R. was probably the guilty party, though Private R—1 and the men who did duty on kitchen police after returning from hospital may have contributed their share toward the later cases.

The disinfection of the barracks occupied by K Company and of the effects of the typhoid patients had not been thorough, and this fact may have also contributed to the result.

Where there are so many possible channels of infection with a company it is difficult or impossible to decide which was most concerned, but the evidence of company infection was overwhelming, and the lessons to be drawn are:

1. The importance of early and correct diagnosis, with the assistance of laboratory investigation. Had cases 4, 5, 6, 10, and 11 been suspected a correct diagnosis in at least 4 of them could have been made early by laboratory methods, and these cases would not have been returned to the company to prove a source of possible infection to others.
2. The necessity of prompt search for carriers and undiagnosed cases from the first suspicion of the presence of the disease.
3. The necessity of retaining in hospital all typhoid convalescents until they have been proven not to be carriers.
4. The importance of the utmost thoroughness in attention to the details of disinfection.

CEREBROSPINAL MENINGITIS.

Thirteen cases of this formidable disease, with 7 deaths, occurred during the year, which is a gratifying reduction from the preceding year's record of 33 cases with 20 deaths.

Five cases occurred at Columbus Barracks between the 26th of January and the 6th of May, of which 3 were fatal, in spite of the use of Flexner's antimeningococcus serum.

Four cases of this disease occurred at the recruit depot at Jefferson Barracks during the month of December and 2 others on the 10th and 11th of January, 1909. Maj. Percy M. Ashburn was sent to investigate this outbreak. A careful investigation was made by him to discover whether the source of infection might be a carrier—a test of great complexity, as the average enlisted strength of this depot is 1,500 men and an average of 40 new men were received daily. He studied in a very careful and painstaking manner the nasal secretions of about 70 persons constituting the permanent personnel with whom the patients came in contact, but in no case was the meningococcus found present in the nasal secretion.

Of the 6 cases, 2 died, in 1 the antimeningococcus serum not having been used because of its failure to arrive in time and in the other its use began only on the sixth day. Of the 4 cases in which the antimeningococcus serum was used promptly after the beginning of the attack all recovered.

A recruit who left Jefferson Barracks depot on January 12 for Fort Douglas, Utah, developed the disease at that post on January 23 and died.

MALARIA.

The occurrence of malarial fever continues to decrease in a most gratifying manner. The admission rate was 26.69 for 1908, as compared with 30.20 for 1907, which in its turn was the lowest rate on record in this office. So gratifying a diminution is the strongest evidence of the efficacy of the continued application of sanitary measures for the prevention of disease, based upon an accurate knowledge of its method of propagation. In the case of malaria, these are the screening of buildings, especially all porches, the use of head nets for guard duty, and measures directed against the propagation of mosquitoes, such as drainage, petrolization of breeding places, and the cutting of grass and bushes in the vicinity of posts.

The 10 posts having highest admission rates for malarial diseases.

[Ratio per 1,000 of mean strength.]

	Mean strength.		Malarial diseases, total ratio.	
	1908.	1907.	1908.	1907.
Jefferson Barracks, Mo.....	900	706	152.22	89.24
Fort Clark, Tex.....	398	454	150.75	57.27
Fort Washington, Md.....	298	220	144.30	263.64
Fort Sill, Okla.....	377	239	98.14	41.84
Fort Logan H. Roots, Ark.....	192	122	93.74	8.20
Fort Howard, Md.....	350	232	82.86	185.34
West Point, N. Y.....	668	554	76.35	110.11
Fort Morgan, Ala.....	239	59	75.31	84.75
Fort Assiniboine, Mont.....	147	144	74.83	27.78
Fort Thomas, Ky.....	472	427	74.15	7.03
Total United States.....	46,316	35,132	26.69	30.20

Jefferson Barracks has advanced from seventh place last year to the first place, and Fort Clark, which did not appear on the similar

table for 1907, is second. The former, being a recruit depot, has a transient population and the reasons for fluctuations in the occurrence of malaria must be sought rather among the civil population from which the recruits were drawn than from conditions at the post.

The chief surgeon assigns the increase at Fort Clark to the fact that the post received a new garrison, coming from Camp Stotsenburg, P. I., one of the most malarious posts in the Philippines, and that the infections were in this way imported into the garrison rather than incurred at the post. A similar explanation is given for the increase at Fort Logan H. Roots, although the chief surgeon remarks also that the screening against mosquitoes was only completed during the summer of 1908, after many complaints by the medical officer. In his opinion, if this work had been done during the winter, as was recommended, the occurrence of malaria would have been reduced.

Fort Washington, Md., although having still a large admission rate, shows a great reduction in each succeeding year, the same being true of Fort Howard, Md.

The occurrence of this disease at Fort Sill, Okla., is attributed to low ground in the neighborhood of the post, which has not yet been effectively drained.

UNDETERMINED FEVERS.

The admission rate for these fevers was 3.80, as compared with 4.67 in 1907. This is less than one-half of the ratio for 1906, which was 7.73. The different diagnoses included under this head are shown in the following table:

Undetermined fevers.

Disease.	United States.	Alaska.	Cuba.	Hawaii.	Philippine Islands.	Transports.	Total army.
Febricula.....	51	.....	72	2	173	.....	298
Simple continued fever, cause unknown..	39	.....	10	.....	43	.....	92
Fever, type undetermined.....	41	.....	34	.....	25	1	101
Ephemeral fever.....	32	2	5	.....	48	.....	87
Thermic fever.....	.....	.....	4	.....	9	.....	13
Continued fever, type undetermined.....	13	.....	2	.....	5	.....	20
Total.....	176	2	127	2	303	1	611
Ratios, year 1908.....	3.80	1.97	27.06	7.84	25.31	0.87	9.34

SMALLPOX.

Twelve cases of variola occurred during the year, coming from nine different stations. Two of these were hospital corps men who contracted the infection while nursing patients. In no other case does the disease appear to have been contracted at the post from the preceding case, with the possible exception of one at Fort Lawton, Wash. The three cases reported from Fort Mackenzie, Wyo., were all infected at the same time while en route to that post.

EXOPHTHALMIC GOITRE.

The surgeon at Fort Worden, Wash., reported 6 cases of this disease, and stated that it was prevalent in the near-by town of Fort Townsend. Fort Flagler, however, which has the same water supply as Fort Worden and the city, did not report any cases.

TUBERCULOSIS.

The admission rate for tuberculosis, 4.08, and the death rate, 0.40, are both less than for the preceding year, when the admission and death rate among colored troops were more than double those of white troops. The discharge rate, 2.77, was also less than for 1907, when it was 3.93. Although these rates show an improvement over the preceding years, they are larger than in the majority of the foreign armies.

The occurrence of tuberculosis of the lungs in our army at home is 3.35, in the British army it is 1.9, and in both the German and Austro-Hungarian it is 1.4. It is believed that a factor in this increased occurrence must be a failure in our service to regulate the maximum number of occupants of barracks and guardhouses so as to prevent overcrowding. It is recommended, therefore, that the maximum number of men who should be allowed to occupy each dormitory or squad room be posted on the walls or door of each room, and that this number be limited so that each man shall have a minimum air space of 720 cubic feet; the height above 12 feet in rooms to be disregarded. In guardhouses, in cases of emergency, some degree of overcrowding may be excused, but this should, however, not be allowed beyond a minimum of 500 cubic feet, with the same disregard of height of ceilings over 12 feet.

An important factor in the occurrence of tuberculosis in the army is its prevalence in civil life, and the impossibility of detecting latent infections in recruits. The importance of this factor is shown by the fact that more than one-third of all cases of tuberculosis in the army occur in the first year of enlistment. The proportion of soldiers in the army serving their first year of enlistment is about 32 per cent.

That company epidemics are not a feature in the spread of this disease is shown by the fact that out of 819 company organizations, including bands as such, during the year 1 case of tuberculosis occurred in each of 149 companies, 2 cases each in 24, 3 cases each in 2, and more than 3 cases in only 1 company.

Medical science now offers several test reactions by which the presence of tuberculosis in individuals can be demonstrated with a fair degree of accuracy, but as these tests respond to latent cases as well as to active tuberculosis, and as the former is very common in otherwise healthy men, to make the presence of latent tuberculosis the cause of rejection of recruits would be to very greatly limit the field from which the army can be recruited. It is to be anticipated, however, that the active campaign against tuberculosis which has been initiated in recent years, including a great tendency to segregate the infected in sanatoria, will, by reducing the amount of tuberculosis in the population, in like manner reduce the number of recruits which bring latent tuberculosis infection into the army.

INSANITY.

This class of affection showed a slight decrease also in the admission rate, which was 1.58, as compared with 1.79 for 1907.

ALCOHOLISM.

This cause of noneffectiveness steadily increased from year to year since 1898 until this year, which shows a decided diminution,

the ratio of admissions being 30.31, as compared with 36.09 for 1907. The admission rate for white, as compared with colored, troops is 30.47 to 20.72.

VENEREAL DISEASES.

Taking all the venereal diseases together, with their results, this class of infections continues to increase, as might be expected of any contagious disease against which the sanitary authorities take no measures of isolation or prevention. The increase is entirely in the admissions for gonorrhea, both syphilis and chancroids showing a diminished rate. The colored troops in the United States show a much higher admission rate for all of these diseases than the whites, the former being for all together 281.77, as compared with 173.14 for the latter. The greater incidence of syphilis in the colored race is especially marked.

The magnitude of the evil and the large loss from inefficiency in addition to humanitarian considerations, have induced the military authorities at a number of military posts to take earnest steps to check the spread of these infections. Such steps have been the instruction of soldiers by lectures as to the danger of venereal diseases and the healthiness of continence; periodical inspections to detect and subject to medical observation and treatment those found diseased; the withdrawal of passes to be absent from the post of such, and the issue of preventive medicines for local application to such as will not be restrained by considerations of morality or prudence from exposure. These antiseptic applications are given only upon the personal request of individuals. If such steps were taken universally throughout the army and a campaign of education instituted which should reach each recruit from his admission to the service, it is believed that the evil record of the American Army might be greatly bettered.

UNCINARIASIS.

On December 7, 1908, Captain Joseph F. Siler, reported from the recruit depot at Fort Slocum, N. Y., that out of 19 southern recruits examined for uncinarial infection, 16 were found to be infected with hook worm. This report was sent to chief surgeons with the request that medical officers report any observations which they might make on this subject. A later report from Captain Siler covering 124 southern recruits showed 109 infections, a percentage of 87.9, which is even higher than the first report. These figures excluded men who had been many years away from their southern homes, or who had lived only a short time in southern cities. Observations made by Major Chamberlain at Jackson Barracks, in a very interesting report, gave the following figures:

	Number examined.	Number infected with hookworms.	Per cent. infection.	Average length of service.
				<i>Years.</i>
Southern-bred recruits.....	44	30	68	.....
Southern-bred soldiers in first enlistment.....	57	31	54	1.1
Southern-bred soldiers in second or subsequent enlistment.....	34	5	15	6.4

Eight cases were reported from the recruit depot at Columbus Barracks, Ohio, but the number of examinations is not stated. Examination of 6 southern soldiers (not recruits) at Fort Walla Walla,

Wash., showed one infection. At Fort Rosecrans 4 southern soldiers were examined, but none were found to be infected. The surgeon, Fort Fremont, reports 9 cases from among the patients admitted to hospital. The total number of cases examined is not stated, but as it is a one-company post, it may be assumed to be not large. The residence is reported as follows: Kentucky 5, Georgia 2, Indiana 1, Massachusetts 1. The two latter had been stationed at the post a year and a half, whereas in 6 of the other cases the residence at the post was less than six months, and in 4 it was two weeks or less.

At Fort Logan 100 men from all parts of the country were examined and none found to be infected. Taking together the figures for southern recruits at Fort Slocum and Jackson Barracks, 139 infections are found in 168 men examined, being 82.74 per cent. So high a percentage among the selected candidates sent by the recruiting officers to depots for examination would indicate a very extensive degree of the infection among the rural population of the Southern States.

Both Captain Siler and Major Chamberlain agree that the physique of southern recruits is less vigorous and robust than is the case with those from other parts of the country, and they attribute this to the injurious influence of this infection in childhood and adolescence. The latter shows that the absolute weight of southern recruits is less than those from the North (although the former are taller) and that the weight of the infected individuals is less than that of those not infected. The statistics quoted by him deal, however, with numbers too small for safe deductions. The heights and weights of southern recruits given by him are above the average of white recruits for the whole army for the current year, and the fact that the weight to height proportion is less than for northern recruits may be due to racial or other causes, among which a less admixture of recent European immigrants may be a factor.

A further study of this question with larger numbers will prove of interest.

In the army of Cuban pacification, an examination of the entire command was made at seven posts, while at one, Pinar del Rio, it was limited to men of southern birth or residence. At Holguin the surgeon selected those of anemic appearance only, without regard to place of nativity or residence. The examinations at this post were made after the preliminary exhibition of a cathartic, which, as Captain Siler points out in his reports, is disadvantageous, owing to the great dilution of the feces caused by it. The following were the results of these examinations:

Post.	Number examined.	Number infected.	Per cent.	Number examined born or resided in Southern States.	Number infected.	Per cent.
Caibarien.....	137			46		
Cardenas.....	295	46	15.6	50	13	26
Camp Columbia.....	1,086	8	.74	198	7	3.53
Cienfuegos.....	303			(a)		
Placetas.....	270	7	2.6	33	7	21.2
Sagua La Grande.....	130			6		
Morro Barracks.....	282	11	3.9	30	9	30
Pinar del Rio.....	51			51		
Holguin.....	32			(a)		
Total.....	2,586	72	2.8	414	36	8.7

(a) Not stated.

This study made on so large a scale is of great value as an index of the prevalence of this infection in the army. It shows that the proportion of infected men in this army (the marines not being included) was 2.8 per cent; of those having southern birth or residence 9 per cent; and of those having other than southern birth or residence, 1.6 per cent. Regarding the wide variation in the occurrence of the disease at the different posts, the chief surgeon, Lieut. Col. H. P. Birmingham, remarks:

Camp Columbia.—The ova were found in those born in or former residents of Southern States.

Cardenas.—At this post a peculiar condition seems to have existed. The majority of those infected were not from Southern States; 3 were foreign born, and 27 were from Northern or States not usually considered favorable to ankylostoma infection. Of the 46 infected only 16 were from Southern States. This seeming incongruity is explained by the surgeon as due to an infection existing throughout that belt of country.

Holguin.—Thirty-two specially selected cases were examined; 28 were anemic, 3 distinctly so and 25 slightly. At this post a saline purgative was administered. The findings were all negative. The surgeon remarks that boiled water has been constantly used for drinking, and uncooked vegetables seldom partaken of.

Pinar del Río.—Fifty-one specially selected cases were examined, 49 of these were in excellent physical condition, the 2 remaining cases in which infection might have been expected proved negative.

Placetas.—At this post the examination seems to have been carried out in a particularly careful manner, and the findings would seem worthy of special consideration. Two hundred and seventy men were examined; 7, or 2.5 per cent, were infected. From the method of examination pursued at this post, it would seem that due weight should be attached to the findings as a more than fair index of the prevalence of ankylostoma as existing among the present enlisted personnel in the army, where local influences do not exist.

Santiago (Morro Barracks).—At this post also the examination seems to have been carried out in a very thorough and painstaking manner. Two hundred and eighty-two men were examined; 11, or 3.9 per cent, were infected. Of the 11 infected, 9 were born in Southern States; 1 during the past five years has resided in two Southern States and Cuba; and 1 has resided in States other than Southern, and for two years presumably has served in Cuba.

The examiner at Columbia Barracks expresses the opinion that infection in Cuba under the conditions of military service there is unlikely and this seems to be borne out by the fact that the infections there and at Placetas and Morro Barracks were almost exclusively among the southern men. At Cardenas, where most of the positive cases were not from the Southern States, these may have been, as suggested by the surgeon, a local source of infection.

The duration of this infection is an important question, since under the good hygienic conditions of military life infection in the service would seem not to be very probable. Of the cases reported from Cuba the length of the service is given in 24. Sixteen were in their first enlistment, 11 of these being in their first year; 4 were in their second enlistment; and 4 had served more than two enlistments. Of the 8 who had served more than three years it is noted that in addition to their two years' service in Cuba 5 had served within five years in one of the Southern States or the Philippines; in 1 the place of preceding service is not stated, and in 2 it was not in a recognized focus of infection. One of these men went from Mississippi to Fort Ethan Allen, Vt., where he remained until he went to Cuba; the other, a Pennsylvania miner of eight years' service, had been within five years in Pennsylvania, California, Wyoming, and New York. It seems that either the infection of these two men occurred in Cuba, or that the life of the parasite in the human intestines exceeds four years.

All the observers note that in many cases the infection has no evident effect upon the health or appearance of the individual. This agrees with observations in the Philippines, both upon American soldiers and natives. Eosiniphilia is usually present, but not always; nearly one-fourth of the cases reported by Chamberlain showing less than 5 per cent. The hæmoglobin is in like manner usually below normal, but in most cases not greatly so. The diagnosis in mild cases must rest upon microscopic examinations of the feces and in cases where the parasites are few a number of slides must be often examined before eggs are found.

The tendency of the disease is to disappear with length of service. As cases do not pass the scrutiny of recruiting officers unless there is such toleration as to permit of a healthy appearance, and as when recognized, they yield readily to appropriate treatment, this disease, in spite of its vast economic importance in the Southern States, is believed not to affect greatly the health and efficiency of the army.

In 800 examinations of feces of healthy men at Camp Columbia, Cuba, it was noted that ova of *ascaris lumbricoides* were found eight times and *oxyuris vermicularis* twice, neither *cercomonas*, *trichomonas*, nor *trichocephalus dispar* were observed.

In 100 examinations at Fort Logan *ameba coli* was reported as found three times, ova of *ascaris lumbricoides* once, and *strongylus intestinalis* once.

In 15 examinations at Fort Fremont, S. C., of men admitted to hospital for various causes, *cercomonas* were reported twice, *trichocephalus dispar* once, and *entomeba coli* eight times.

INFLUENCE OF STATION.

The post having the highest admission rate for the year was Fort Mott, N. J., and that having the lowest Fort Dupont, Del., the latter having likewise the lowest constant noneffective rate from all causes. These are neighboring posts upon opposite sides of the Delaware River and both garrisoned by coast artillery, the mean strength at Fort Mott being 225 and at Fort Dupont 332. No death from disease occurred at either post. An examination of the sick report from Fort Mott would indicate that the very high admission rate was not due to the prevalence of any special disease, but rather to the facility with which soldiers were excused from duty for a great variety of trifling illnesses.

Fort Benjamin Harrison, Ind., had the highest noneffective rate from all causes, Fort Thomas, Ky., being second; this post having been also second last year.

As regards relative health of military departments, the Department of the Lakes had the highest admission and noneffective rates and the Department of California the lowest. The Department of Colorado had the highest death rate and the highest rate for typhoid fever and pneumonia and the lowest rate for malaria and dysentery. The Department of California had the lowest rate for typhoid; the Department of Texas the highest rate for malaria; the Department of the Lakes the highest rate for cerebrospinal meningitis, tuberculosis, and dysentery, and the Department of Dakota had the lowest rate for tuberculosis. The Department of the East had the

lowest rate for pneumonia, the Department of the Gulf had the highest rates for diarrhea and undetermined fevers, the Department of California the lowest rate for diarrhea, and the Department of the Missouri the lowest rate for undetermined fevers.

INFLUENCE OF AGE AND LENGTH OF SERVICE.

As usual, the admission and discharge and noneffective rates were highest for the younger soldiers or those serving their first enlistment, and the death rate was highest among those 50 years of age or over, having ten years or more service. The lowest admission and noneffective rates occurred in soldiers between 25 and 50 years of age, having long service.

INFLUENCE OF SEASON.

Excluding venereal diseases, alcoholism, and injuries, the highest admission rate occurred in January and the highest death rate in May. The highest noneffective rate occurred in February. The lowest admission rate was in November, and the lowest death rate was the same for August and December. The lowest constantly noneffective was in September.

INFLUENCE OF RACE.

For 1908 the rates for admission and discharge were higher for the white troops, and the rates for death and constantly noneffective were higher for the colored troops in the United States (continental), whereas for 1907 all the rates, except admission, were higher for the colored troops.

DISCHARGES FOR DISABILITY.

The disability discharge rate for the United States (continental) for 1908 was 21.35, as compared with 25.36 for 1907 and 32.29 for 1906. This reduction is probably due to the fact that regulations now require all recruits to be examined by a medical officer before enlistment.

The principal causes of discharges, with the percentage of the total discharges, were as follows: (1) Tuberculosis, 14.46; (2) venereal diseases, 14.24; (3) congenital malformation and arrested development, 9.89; (4) epilepsy, 6.63; (5) insanity, 6.20. The proportion of total discharge for those discharged for disabilities contracted previous to entrance to service was 47 per cent.

SANITATION.

The hygienic errors noted in the monthly sanitary reports of medical officers are in most cases of minor importance and susceptible of correction by local authorities. In such cases remedial action is as a rule promptly taken without the necessity of intervention of higher authority, thus giving a gratifying demonstration of the progress

made by the officers of the line of the army in a realization of the importance of safeguarding the health of the troops. The uncorrected errors are usually those which require action on the part of the War Department or of Congress because they involve the outlay of large sums of money. Such are necessary improvements in water supply, sewer systems, and barrack construction.

As the population of the country increases and posts are more and more surrounded by a dense civil population, the necessity of securing pure sources of water supply becomes more urgent and the difficulty of safeguarding them increasingly difficult; also the duty becomes imperative of making such disposition of wastes as will not be offensive or dangerous to the surrounding population. In such matters it is believed that the National Government should take the lead. Some form of biological or other purification of sewage will probably be necessary for a large number of posts in the near future. Such plants are expensive to install, but when once constructed of adequate size and on proper principles, are inexpensive in operation. It is believed that if projects for such constructions were presented to Congress, liberal provision would be made for them, since the public safety is so obviously concerned. A case in point is the water supply and sewage disposal of Fort Sheridan, Ill. This large and important post, in common with a population of 3,000,000 which dwells on the shores of Lake Michigan, and which is increasing at the rate of 100,000 a year, must draw their water supply from the lake. Lake Michigan has no currents except the shifting ones due to the force of the winds, and the process of purification of sewage poured into it proceeds slowly. In spite of the diversion of the sewage of a large portion of the city of Chicago through the drainage canal into the Illinois River, the southern end of the lake is being grossly contaminated by the ring of populous communities surrounding it, including that part of the city of Chicago south of Sixty-seventh street, which discharges its sewage into the lake through the Little Calumet River. An organization has been formed called the Lake Michigan Water Commission, with representatives from the three States interested, to check this constantly increasing contamination. The War Department must necessarily cooperate in this laudable movement.

The commanding-general of the Department of the Lakes, Maj. Gen. F. D. Grant, states the case forcibly as follows:

Fort Sheridan is doing its share toward polluting its own and neighbor's water supply, for the sewage of that post is emptied into the lake about half a mile from the intake of its water system. If, as the commanding officer reports, there is no sickness in the post traceable to the water supply, such must be attributed to good fortune, and the present happy situation is likely to be reversed any day. It is my opinion that a sewage-disposal plant should be installed at Fort Sheridan for several reasons. It is manifestly absurd for Fort Sheridan to pollute its own water supply, which is what is now being done. Should a man deliberately drain his privy into his well he would be doing little more than what the situation presents at Fort Sheridan. Then, too, the Government is under obligation not only to preserve the health of its soldiers by providing the best sanitary arrangements, but to set an example to its citizens in such arrangements.

The communities on either side of this post have taken steps to purify their sewage and the obligation is imperative that the same action be taken by the Government for Fort Sheridan.

It will probably be also necessary either to carry the intake farther out into the lake or to filter the water before its admission to the

mains of the post. A somewhat similar case as regards water supply is that of Fort Niagara, which draws its water from the Niagara River, near its mouth, where it is much polluted. A sample of water taken from the lake at a point half a mile from shore and $1\frac{1}{2}$ miles from the mouth of the river was found to be also unsafe.

The post was protected from typhoid fever during the year by the troublesome expedient of boiling all its drinking water, a procedure which is certain, sooner or later, to be neglected by careless or indolent persons, with unfortunate results. It has been recommended by this office that, as a cheap electric supply is available, the purification of the water supply by ozone be considered.

A few posts are, however, at present obliged to boil their drinking water, and in all such cases this measure should be considered as one of a temporary nature and arrangements made for a permanent pure supply for all purposes.

At Fort Leavenworth the source of water supply is from the Missouri River, the intake being about 1,000 yards below the outlet of the post sewer. To prevent the contamination of the water supply, a purification plant for the sewage has been established, but it is reported as unsatisfactory because of the unfinished condition of the filtration beds. A sanitary inspection in October showed that for the purification of the water 10 organizations depended upon the use of Pasteur Chamberlain filters; 3 to sterilizing the water with Forbes water apparatus; 8 boiled it in other ways; and 1, out of abundant precaution, after the water had passed through the Forbes sterilizer, boiled it again. No efficient method of cleaning and supervising the Pasteur filters seems to have been used, so that the water after passing through them gave a far higher bacteriological count than the water drawn from the taps without filtration. The bacteriological count in the former case was from 2,500 to 500,000 colonies per cubic centimeter, while in the tap water it was only 800.

The water supply at the Presidio of San Francisco, Cal., and at Fort Thomas, Ky., and at Fort Logan, Colo., is reported as suspicious and requiring to be boiled for drinking purposes.

At Fort Meade, S. Dak., the water supply is inadequate. It is understood that steps are being taken to correct the deficiencies at all these places.

DISPOSAL OF WASTES.

Defects in the methods of disposal of sewage have been noted at a number of posts, but as a rule these deficiencies have been corrected. As noted above, the sewage purification plant at Fort Leavenworth has not functioned satisfactorily during the year, and as is the case with Fort Sheridan also the purity of the water supply is dependent to a considerable extent upon the proper purification of the sewage.

At Fort Benjamin Harrison it was reported that although the septic tank and contact filters worked well, the sand filter, which is intended to further purify the effluent so as to remove all putrescible matter from it, has failed to function satisfactorily because of faulty construction. The plant has also been overworked by passing through it a much larger volume of sewage than it was intended to handle.

The sewage, therefore, has been discharged into a neighboring stream without the high standard of purification required by the specifications prepared in the office of the Quartermaster-General.

Complaints have also been made of defects in the sewer systems at Key West and Jackson Barracks, but as there is doubt of the permanence of both of these posts in their locations, the remedial measures must of necessity be of temporary nature.

Reports of overcrowding of barracks and guardhouses together with defective ventilation, which have been sent in by medical officers with increasing frequency since the increase of the army in 1901, have assumed large proportions in the year just passed, when the strength of the army has been increased without a proportionate gain of barrack space for their accommodation. Such conditions have been reported not only from posts in the United States, but also from the Philippines.

From a number of the permanent stations in the United States overcrowding has been reported during the year.

The chief surgeon, Department of the East, in his annual report states:

The artillery posts, with few exceptions, and two of the infantry posts report overcrowding of barracks and guardhouses. Measures of relief, by better ventilation, by temporarily quartering men in other buildings or tents, and by hastening completion of barracks have been generally adopted, and it is confidently expected that in a short time each enlisted man and prisoner in the department will have sufficient floor and air space for his proper accommodation, except possibly at Forts Wadsworth and Jay, where present quarters must of necessity be used until the new barracks are built. The attention which has been drawn to this matter of overcrowding and insufficient ventilation can not but have beneficent results in increased efficiency and the prevention of epidemics of influenza, coryza, and tonsillitis, which have occurred in the past. It has been necessary in the case of some of the guardhouses to exercise administrative clemency to reduce the number of prisoners therein.

Overcrowded condition of barracks at Forts Revere and Adams, to which attention was called by the surgeon of the post in each case, was relieved by the transfer of a company from each post to another station. More common and more excessive than overcrowding of barracks was that of the guardhouses at a number of posts. This was reported to be due in part to the fact that the military prisons were full and military convicts were left to serve their sentences at a number of posts instead of being transferred to the military prisons. The following examples of excessive overcrowding in guardhouses were reported, the figures given being cubic feet air space per capita:

Fort Yellowstone, Wyo.....	285
Fort Adams, R. I.....	284
Fort Porter, N. Y.....	204
Fort Sill, Okla.....	279
Fort Huachuca, Ariz.....	150

To put a stop to this abuse, it has been several times recommended in specific instances that orders be issued to post commanders that under no circumstances should the number of individuals occupying the guardhouses be permitted to exceed such a number as will allow a minimum of 500 cubic feet per capita cubic air space.

In many cases marked deleterious effects upon the health of the command are stated to have been the result of the overcrowding and defective ventilation. Diseases of the respiratory organs, espe-

cially tonsillitis, pharyngitis, bronchitis, and tuberculosis, have been attributed to these causes. That such conditions do contribute powerfully to the prevalence of the diseases mentioned is beyond question. Improved housing of troops in the British army has been followed by a progressive fall in the tuberculosis rate which is now only about one-half that in our service.

The recommendation made in the last report of this office is renewed—that there should be a fixed standard of floor and air space in barracks and guardhouses—and it is believed that the adoption of such a standard is one of the most important sanitary reforms which the welfare of the army now demands.

While in most of the new barracks adequate provision has been made for ventilation, there seems to have been often a failure to make proper use of the means provided, the natural tendency of soldiers being to close up all openings in cold weather. To effectually remedy this an active cooperation of the company officers with the medical officers is necessary.

In previous reports attention has been called to the importance of certain insects, flies, and mosquitoes as carriers of disease, and the necessity for thorough screening of barracks and quarters at posts where these insects are found has been insisted upon. Sanitary reports continue, however, to refer to the insufficient nature of the screening which is being done, especially the use of half-screens in windows, and of screen doors without intervening vestibules. Half-screened windows are practically useless in barracks because the unscreened portion of the window is constantly being left open. It is recommended that all window screens be made full length as is now required in hospitals and that all screen doors be double, with an intervening vestibule.

Continued effort has been made during the year to control those diseases which are causing the largest number of deaths and the greatest amount of inefficiency in the army. Especially has this been the case with venereal diseases, tuberculosis, and typhoid fever. Instructions on these subjects have been sent to all medical officers.

CAMPS OF INSTRUCTION.

The health of the commands in the camps of instruction of 1908 was remarkably good. Typhoid fever, which in the camps of 1906 caused 101 admissions, in 1908 gave a total of only 17 admissions, these including all the cases contracted on the march to and from camp as well as those which occurred in camp. Other infectious diseases were also notable by their comparative absence from the sick returns. From several of the camps, however, the chief surgeons have reported that militia commands arrived at the camps with one or more members already ill with typhoid fever, which must have commenced before they started for camp. To prevent just such a danger as this in the field, paragraph 663 (F. S. R.) was devised. This paragraph, however, does not seem to exactly cover the case of militia commands proceeding to camps of instruction, and it is therefore recommended, as a matter of much importance, that a critical examination be made of each militia organization by a regular medical officer of experience as soon as it reaches a camp of instruction, with a view to the segregation of all cases of contagious disease.

The sanitary conditions in the camps were generally good. From most of them it was reported that insufficient provision was made for the protection of food from dust and flies, which defect should be corrected in future camps, as it opens the way for the spread of typhoid fever and other intestinal complaints.

Very few of the permanent camps had a piped water supply, and none of them a sewerage system. Both of these items should be provided for in all permanent camps. The water supply of the camp at Leon Springs, Tex., was reported entirely insufficient for the needs of the command, but it was expected that this deficiency could be made good without much difficulty. At the camp at Chickamauga Park there were two water supplies—one for drinking and one for other purposes. Such a double source of water supply is highly objectionable, and it is recommended that for future maneuvers on this site a sufficient supply of pure water for all purposes be secured and no other water piped to the grounds. The water supply of the camp at Fort D. A. Russell is said to have been unsatisfactory in quality and to have caused intestinal troubles.

From all camps came the usual reports of the insufficient number of medical officers and hospital corps men, though all available officers and men were taken from posts to supply the field commands as far as possible. The entire medical personnel thus obtained was scarcely sufficient to care for the sick and entirely inadequate to man the field organizations of the medical department, which should properly belong to the commands of which they form a part. This is a very serious condition, and shows the disastrous results which may be expected in time of war unless a more liberal allowance of personnel, both officers and men, is provided than that now authorized.

From every camp also was reported the usual deficiency of transportation for the medical department, so that it was impossible to move those medical department organizations which are normally mobile. This, also, is a serious condition and emphasizes the importance of the recommendations frequently made by this office that the medical department organizations should be supplied with and should keep on hand ready for instant use their full quota of field transportation. The four companies of the Hospital Corps should have the full transportation and equipment of ambulance companies and be prepared to take the field as such at a moment's notice.

Nearly all chief surgeons reported an insufficient number of ambulances, and that those supplied were of several different patterns, most of them incomplete, and many unserviceable. The absence of lamps from the ambulances seriously impaired their efficiency for night work.

A model ambulance has been adopted after most careful and painstaking investigation on the part of a board composed of experienced officers of the Medical and Quartermaster's departments. It is recommended that this type of ambulance be promptly issued to all posts, the obsolete patterns being called in and remodeled, or in the case of patterns not susceptible of being remodeled that they be either condemned or converted to other uses at the posts, the red cross, in this event, being removed from them and they being no longer considered as medical transportation. In addition a reserve of new ambulances should be accumulated by annual installments

at the depots of the Quartermaster's Department, which should be sufficient for the needs of the maximum army which can be put in the field within a space of one month. Under present conditions the Medical Department is entirely dependent in this respect upon the Quartermaster's Department, and it is useless for the former to proceed with its preparations for war conditions unless the latter will provide *pari passu* the essential equipment which it is obligated to supply.

The great majority of the militia commands are reported as having been insufficiently equipped with medical supplies, and many of them without any at all. Many of their medical officers apparently did not know what supplies they should have nor how they could obtain them. The preparedness of their medical departments for active service was generally reported as woefully deficient. A medical officer should be attached to the Militia Division of the War Department, whose special duty it should be to advise and assist in the organization of the Medical Department of the militia, so as to put them on a plane of preparedness in this essential respect. The appropriations for the equipment of the militia are liberal, and the Medical Department has on hand ready for issue the needed equipment. If the attention of the military authorities of the States is called to the necessity for the organization of field hospitals and ambulance companies and the necessity of such provision in order that they may be considered to have the organization contemplated by the law, it will undoubtedly be done. It is recommended that the state authorities be required to organize and thoroughly equip a field hospital with its ambulance company for each three regiments, in addition to the regimental medical service.

ALASKA.

The average mean strength of the troops serving in Alaska during the year was 1,015, composed of infantry, Signal Corps, and Hospital Corps, all white.

Alaska still maintains its record as the healthiest territory in which American troops are stationed, the total admission and constantly noneffective rates having continuously improved each year since 1905. The rates for the year 1908 are 419.70 and 12.99, as compared with 657.62 and 21.22 for the year 1907. The death rate is larger than in previous years, being 9.17, as compared with 3.40 for 1907, there having been in all 10 deaths as compared with 3 in the preceding year. This increase is due to the large proportion of deaths by violence from the following causes: Drowning, 3; suicide, 2; freezing, 1; and cerebral hemorrhage, caused by a boxing contest, 1.

The principal causes of admission were tonsillitis 23, muscular rheumatism 14, and acute bronchitis 13. There were 6 admissions for appendicitis, all of which recovered. One case of typhoid fever occurred during the year. The highest admission and noneffective rates were in February, the lowest admission rate was in June, and the lowest noneffective rate in May.

Four enlisted men were invalided home, of whom 2 were discharged for disability, 1 died, and 1 returned to duty.

CUBA.

The average mean strength of the troops pertaining to the army serving in Cuba was 4,694, all white. All the admission and discharge for disease rates are somewhat higher than last year, while the death, discharge for injury, and constantly noneffective rates are less. The latter rates are also less than for the United States during 1908.

The principal causes of admission were venereal diseases 202.17, abscesses and furuncles 101.19, diarrhea and enteritis 57.73, dyspepsia 42.82, malaria 39.20, alcoholism 36.43, and bronchitis 27.48. The rates for the last five diseases are all decidedly less than the year before, and although the admissions for venereal diseases are greater, the constantly noneffective rate for them is less. As was the case in 1907, typhoid fever is the principal cause of death, as shown in the following table, but yellow fever caused only 1 death, as compared with 5 in the preceding year.

The highest rate for admissions was at Cienfuegos, for discharges at Guines, and for deaths, total losses, noneffective rate, and days lost by each soldier, Santa Clara.

PREVALENCE OF SPECIAL DISEASES.

TYPHOID FEVER.

Forty cases of this disease with 5 deaths occurred, of which 24 were in the month of January. An epidemic of 25 cases occurred between December 21, 1907, and January 26, 1908, at Columbia Barracks, a part of which shares, with Havana, the advantage of an unimpeachable water supply. The chief surgeon reports as follows concerning it:

An outbreak of typhoid fever appeared among the troops of the Second Squadron, Eleventh Cavalry, and Company I, Signal Corps, immediately after their return from the target range at Guanajay, at which point they had been on duty from November 25 to December 21, 1907, and where the disease originated.

The first case was admitted to the hospital three days after reaching the post, the man having complained of feeling badly two days before leaving camp. The others, with the exception of three men, who will be referred to later, were taken sick within the next three weeks, all having been infected in camp.

The point selected as a camp site was an excellent one, with unlimited room, good drainage, and an abundant water supply from a limestone spring, which was of good quality. The surrounding country was open and rolling, with a pleasant outlook in all directions.

As this camp was to be used as a target range for the entire command at Camp Columbia during the target season, it should have been considered a permanent one. This, however, was not done, but the old pit latrine established, and the water was distributed by barrels throughout the camp, while the spring was not adequately protected from possible pollution. The Forbes sterilizer was in general use. On account of the shallow and rocky soil the latrines had to be frequently changed, so that this unsanitary contrivance was at its worst.

Upon an unofficial visit to this camp about December 5, I found the conditions as stated and made a report to the chief surgeon, as medical inspector of the army, citing these conditions and embodying certain recommendations for their correction, including protection of the source of water supply, the establishment of a pumping plant and reservoir, and the installation of the McCall incinerators.

These recommendations were carried out and thereafter this camp was in all sanitary respects a model one.

An analysis of the water and the fact that the command which preceded and followed this one remained perfectly free from the disease shows that neither the water or other conditions pertaining to the camp were responsible for the origin of the disease, and furthermore, a careful inspection of the town of Guanajay, with Capt. David Baker,

Medical Corps, of the post of Guanajay, and the local health officer, showed the town to be free from typhoid fever, and the fact that the men from the adjoining permanent post of Guanajay (at which post typhoid fever had not appeared for a year) visited the town daily and ate and drank there without infection, is corroborative proof that the disease was not contracted in this town.

A careful analysis of the cases demonstrates to a practical certainty that the disease was introduced by an ambulatory or walking case of typhoid, in the person of a sergeant of the Signal Corps, who had been sick since the latter part of October, but who did not go on sick report while in camp, and who was finally admitted to hospital with what proved to be a mild case of typhoid fever. He was quartermaster and mess sergeant of the company, so it will be seen how intimate were his relations with the men and how readily he could act as a disseminator of infection.

The exact means by or through which this soldier was infected I have been unable to determine, but members of the Signal Corps, in pursuance of their work as linemen and repairmen, are constantly moving about, and it is well known that typhoid fever in a sporadic form prevails in many Cuban towns, and it is believed that the original infection was acquired in that way.

As three of the cases were either cases of prolonged incubation or infection after their return to barracks—a month having elapsed in each case since leaving camp—as a precaution against barrack infection, this part of the command was put in tents and thorough disinfection of the barracks, equipment, and personal effects of the men was carried out. After this disinfection no other case of fever appeared, and Camp Columbia has been free from the disease since.

The occurrence of the disease by organizations was: Company I, Signal Corps, 9; and in the Second Battalion, Eleventh Cavalry, Troop F, 4; G, 6; H, 4. There were two additional cases, one a hospital corps man, who became infected while nursing his comrade sick with the disease, and an engineer soldier, who lived in camp in close proximity to Company I, Signal Corps, and was closely associated with one of the early cases in Troop H. In Company I, Signal Corps, 6 of the 9 cases were in a group of four adjoining tents, one of which was occupied by Sergeant E, who is regarded as the carrier who originated the epidemic. In Troop F, 3 out of the 4 cases occurred in two adjoining tents. In Troop G, 5 out of the 6 cases occurred in three adjoining tents. In Troop H, 3 out of the 4 cases occurred in two adjoining tents.

This epidemic is a marked example of what is believed to be a most common and serious method of infection among troops in camp, viz, by contact from man to man.

UNDETERMINED FEVERS.

The occurrence of this group was greater in absolute number and ratio than in 1907, the ratios being 27.06, as compared with 20.96. The marked diminution of the malarial fevers with the increased number diagnosed as given in the following table shows the growing indisposition on the part of the medical officers to use the diagnosis malaria as a nosological dumping ground for obscure febrile conditions in the absence of definite clinical or microscopical evidence to support such a diagnosis.

Febricula.....	72
Simple continued fever, cause unknown.....	10
Fever, type undetermined.....	34
Ephemeral fever.....	5
Thermic fever.....	4
Continued fever, type undetermined.....	2

Total..... 127

MALARIAL FEVERS.

The admission rate for malarial fevers was noticeably better than the year before, being 39.20 as compared with 51.40 for 1907 and 26.69 for the United States for 1908. This improvement is due to a corresponding amelioration of the conditions of living in the army of Cuban pacification due to improvements in the temporary barracks, the substitution of beds for camp cots whereby more effective use could be made of mosquito nets, and by the withdrawal of troops from some of the smaller stations where adequate provisions for their comfort did not exist.

DYSENTERY.

This infection is not very prevalent in Cuba, the admission rate being 6.82, of which just one-half was amebic—the rate for the Philippines being 26.23.

YELLOW FEVER.

Five cases with one death occurred in February, 1908, in the garrison at Santa Clara, which was composed of a battalion of the Fifteenth Cavalry. Four of these cases occurred in Troop K, and one in Troop M. No other cases occurred during the year in the army and the vigorous campaign which was carried on by the provisional government of intervention resulted in its extinction throughout the island.

SANITATION.

The sanitary condition of the numerous garrisons scattered over the island of Cuba was excellent, although the locations of these were determined by political reasons rather than those of sanitary convenience.

The chief surgeon in his final report remarks:

The sanitary condition of the various posts and stations occupied by this army was, with a few minor exceptions, of a temporary nature, excellent, and no disease attributable to sanitary deficiencies of any kind has been reported.

In concluding his remarks he adds:

In concluding this final report of the work of the medical department of the army of Cuban pacification, it might be well to note that it was composed wholly, as far as its officers were concerned, of commissioned members of the Medical Corps, United States Army, which, I believe, is the first time in our military history where so considerable a body of troops, either for home or foreign service, has been so officered. That this was a wise measure is, I believe, borne out by the results attained, and I am convinced that the same results, at least in a relative way, could be attained by a like body of trained men anywhere or under any conditions, providing they were given the same earnest and thoughtful support which has been accorded the medical department of this army.

In addition to the strictly military duty performed by the medical officers of this army, there were five officers of the corps detailed from it for duty with the civil government, who were engaged in important sanitary work throughout the island under the supervision of Maj. J. R. Kean, Medical Corps, U. S. Army, who was detailed by the War Department, and who, as adviser to the sanitary department of Cuba, was charged with the supervision of all civil sanitary matters on the island.

The commanding general, Maj. Gen. Thomas H. Barry, makes the following comments with reference to the sanitary administration of this army:

Credit for the excellent medical and sanitary conditions that characterized the occupation of Cuba by United States troops from October 6, 1906, to April 1, 1909, is

primarily due to the intelligence and efficiency of the officers and enlisted men of the Medical Department, United States Army, who served in Cuba, either with the army or with the provisional government, especially to the efficient chief surgeon, who, in that capacity and also in his former capacity as medical inspector, proved himself a substantial prop on whom any commanding general might lean with absolute security in all matters medical and sanitary.

PORTO RICO.

The mean enlisted strength of the native Porto Rican troops was the same as last year, 564, no change having been made in the garrison.

The following table shows the movement of sick for the year 1908 as compared with that for 1907:

	Years.	From all causes.		Excluding injuries, venereal diseases, and alcoholism.	
		Total.	In hospital.	Total.	In hospital.
Ratio per 1,000 of mean strength:					
Admissions to sick report.....	1908	1,242.91	1,102.84	918.44	.....
	1907	1,207.45	1,072.70	886.52	.....
Discharges on surgeon's certificate of disability.....	1908	7.09	.....	7.09	.....
	1907	7.09	.....	3.55	.....
Deaths.....	1908	7.09	.....	5.32	.....
	1907	14.18	.....	12.41	.....
Total losses.....	1908	14.18	.....	12.41	.....
	1907	21.27	.....	15.96	.....
Noneffective from sickness.....	1908	37.02	34.40	22.78	20.73
	1907	42.38	39.88	26.85	25.46
Average number of days lost:					
For each soldier.....	1908	13.55	12.59	8.34	7.59
	1907	15.47	14.55	9.80	9.29
For each case.....	1908	10.90	11.42	9.08	.....
	1907	12.81	12.05	11.05	.....

The admission rate was slightly higher, and the discharge rate exactly the same as the previous year. All the other rates were considerably lower than for any year since the statistics have been compiled separately for Porto Rican troops. The death rate ratio, 7.09, was slightly higher than for the total army, but was much lower than for the previous year, when the ratio was 14.18. The principal reduction is in typhoid fever, which caused only 1 death in 1908, and 3 deaths in the preceding year.

The rate for malarial fevers is 219.86, which is a considerable reduction over the two preceding years, but is greatly in excess of the army as a whole, which is 46.33. Venereal diseases give an admission rate of 242.91, which is in excess of the preceding year.

The highest admission rates were in December and the lowest in August. The highest noneffective rate was also in December, and the lowest in July. The deaths were one each from typhoid fever, malarial fever, septicemia, gunshot wound (homicidal).

The following table shows the prevalence of the more important diseases among the Porto Rican troops. It is to be noted that there were no cases of pneumonia, hepatic abscess, appendicitis, or alcoholism among these troops during the year.

Diseases of Porto Rican troops—Admission rates per 1,000 of mean strength.

Venereal diseases.....	242.91
Gonorrhea and results.....	143.62
Chancroid and results.....	60.28
Syphilis and results.....	39.01
Malaria.....	219.86
Influenza.....	83.33
Furuncle.....	78.01
Dyspepsia.....	62.06
Dengue.....	44.33
Measles.....	19.50
Bronchitis, acute and chronic.....	19.50
Dysentery.....	15.96
Smallpox.....	7.09
Typhoid fever.....	5.32
Rheumatism, acute, articular.....	5.32
Filariasis.....	3.55
Tuberculosis, all.....	1.77
Insanity.....	1.77
Dhobie itch.....	1.77

RECRUITING.

Eighty per cent of the recruits examined by medical officers were accepted. This is slightly better than last year.

Forty-five per cent of the accepted candidates were between the ages of 21 to 25, inclusive; only 3 candidates being under this age. Fifty-four per cent were over 25 years.

Fifty-eight per cent were 66 inches, or under, in height, and only one reached the height of 6 feet. Eighty-five per cent of all recruits were under the average height of the American recruit, viz, 67 inches.

Fifty-seven per cent weighed less than 130 pounds and only 5 per cent weighed 150 pounds, or over.

Sixty-six per cent had a chest measurement of 33 inches, or under, and 17 per cent had chest measurements of 35 inches, or over—a considerable improvement over the previous year.

REJECTIONS.

Twenty-five per cent of the rejections were caused by deficiency in weight; 18 per cent for defects of vision, and 10 per cent each for venereal diseases, diseases of the genito-urinary system (nonvenereal), and heart disease. Alcoholism does not appear as a factor for rejections.

Examination of recruits.

	Number.	Ratio per 1,000 exam- ined.
Examined by medical officers.....	450	1,000.00
Accepted.....	360	800.00
By first enlistment.....	52	115.56
By all other enlistments.....	308	684.44
Rejected by medical officers.....	88	195.56
Declined.....	2	4.44

HAWAII.

The garrison of the Hawaiian Islands is situated on the island of Oahu and has been increased during the year from four companies of infantry so that a battalion of engineers were added before the end of the year and 8 companies of cavalry on January 15, 1909. The average enlisted strength during the year, however, was only 255.

All the rates have increased as compared to those of the preceding year, the total admission rate being 1,282.35, and the constantly non-effective rate 37.61, as compared with the admission rate of 1,188.03 and constantly non-effective rate of 42.68 for the whole army.

Except for the very high admission rates for venereal diseases, 239.22, and alcoholism, 74.51, the sanitary record of Hawaii would be excellent; as for diseases, exclusive of these, its admission rate is only 713.72.

There were no cases of typhoid fever, only one of dysentery, and one of tuberculosis during the year. Only two deaths occurred, one from tetanus and one from drowning.

Seven enlisted men were invalidated home during the year, of whom three were subsequently returned to duty, and four discharged on surgeon's certificate of disability.

PHILIPPINE ISLANDS.

AMERICAN TROOPS.

The health of the American troops in the Philippines continues to improve year by year. The admission rate for disease and the constantly non-effective rate are better for 1908 than for 1907, which in turn was better than for any preceding year. The death rate was, however, larger both for disease and external causes. The principal increase in the former was from cholera, which caused 7 deaths as against 1 for the preceding year. Among external causes wounds caused 20 deaths as against 12, and acute poisoning 11 as against 1 for 1907.

The mean strength of the American troops was 11,971, not including a force of native troops, the Philippine Scouts, with a mean strength of 5,085, whose medical statistics will be given separately later. The more important diseases showing a notable reduction are malarial fevers, dysentery, venereal diseases, and bronchitis. On the other hand, there was an increased admission rate for diarrhea and enteritis, appendicitis, and intestinal parasites. The increase in ankylostomal infection, 77 cases as compared with 33, indicated probably only an increased care in searching for this infection.

The diseases causing the highest non-effective rates were venereal diseases, 17.97; malaria, 2.76; dysentery, 2.57; dengue, 1.80; and diarrhea and enteritis, 1.75.

The principal causes of death from diseases were (absolute numbers) tuberculosis, 12; cholera, 7; organic diseases of the heart, 5; and alcoholism, 5. It should be noted that deaths occurring in the United States from diseases originating in the Philippines are credited in this report to the station of the regiment or organization to which the soldier belongs. Thus of the 12 deaths from tuberculosis credited to the Philippines, only 2 actually occurred there, the balance being among soldiers invalidated home on account of that disease. Four cases of sunstroke occurred without a death. No case of snake bite

was reported. Sixteen deaths occurred from gunshot wounds and 4 from other wounds, none of them having occurred in action. There were 13 deaths from drowning.

PREVALENCE OF SPECIAL DISEASES.

TYPHOID FEVER.

The admission rate was 2.76 as compared with 3.50 for 1907, with 5 deaths as against 3 for the preceding year. This rate was less than that for the army. Nine cases occurred in the Cuartel de Espana between November 29 and December 10, in Company M, Twenty-sixth Infantry. The outbreak having been investigated by the board for the study of tropical diseases, the company cook, who gave a history of a former attack and a positive Widal reaction was believed by them to have originated the outbreak, although the bacillus of Eberth was not found in his excreta. The assistant cook was one of the last cases attacked. As the men attacked were not closely associated with each other in barracks it seems probable that contact infection was not a feature of this outbreak, but that all the cases are to be ascribed to infection of the food by the cook.

Typhoid fever, Philippine Islands.

Posts.	Mean strength.	Admissions.	Deaths.
Camp Bumpus, Leyte.....	327	11	.....
Manila posts.....	988	8	.....
Fort William McKinley, Luzon.....	2,354	4	1
Camp Stotsenburg, Luzon.....	981	3	.....
Camp Downes, Leyte.....	281	3	.....
Hollo, Panay.....	177	2	.....
Camp Keithley, Mindanao.....	993	1	.....
Jolo, Jolo.....	942	1	.....
Division hospital, Manila.....	.....	.....	4
Total.....	11,971	33	5

MALARIAL FEVER.

The admission rate for all fevers of this class was 123.97 as compared with 167.79 for 1907, 304.20 for 1906, and 261.55 for 1905. This great improvement is to be ascribed to the steps taken to protect the men at night from the bites of anopheles mosquitoes and doubtless also the measures taken to destroy their breeding places near the garrisons. In this connection the chief surgeon of the Philippines Division states in his annual report as follows:

Although every possible precaution has been observed to prevent infection, malarial diseases occupy the third place among causes of sickness, following immediately after diseases affecting the digestive system. Mosquito bars have been universally used, and recommendations were made for the screening of all buildings occupied by troops, but as yet the screens have not been installed. It is my opinion that not only to safeguard against malarial infection, but for the personal comfort of the command as well, the expenditure of the money is justifiable for screening every permanent post in the islands. The infection of the anopheles in a community adjoining military stations should be considered in this connection, through new commands suffering from malarial diseases. Many of the posts occupied by American troops in this division are constructed of lumber and, with slight alterations, could be arranged for screening. Many of the smaller posts occupied by native troops in the pueblos could also be screened. It is my opinion that a large number of the command, both Americans and natives, suffer from latent malaria in the Philippine Islands, and only exhibit

active symptoms of the disease when called upon to perform unusual duty, such as campaigning or severe fatigue labor. This was exemplified at Fort William McKinley, during the last calendar year, during the employment of the Twenty-ninth Infantry in digging ditches in the hot sun for several days, resulting in the sickness of a large number of the men. Upon examination of their blood a large percentage of them were found to contain malaria parasites.

The chief surgeon of the Department of Mindanao observes as follows: "Apart from admissions due to external causes, the highest admission rate during the year was caused by malaria, and of a total of 884 cases the post of Jolo had 428 cases. The insanitary condition of the town of Jolo was responsible for this large number of cases, and in June, 1908, arrangements were made with the municipal authorities by which a sanitary squad was organized under the supervision of a medical officer. This squad commenced work in July, cleaning the city and doing away with mosquito-breeding places, and the efficiency of its work is shown by a progressive decrease in the number of cases of malaria admitted, which from the maximum of 68 in the month of April fell to the minimum of 7 in the month of November."

"Rules requiring men to sleep under mosquito bars are rigidly carried out in the department, and the question of drainage and the filling in of mosquito-breeding places is receiving appropriate attention."

UNDETERMINED FEVERS.

The admission rate for these fevers was 25.31, as compared with 15.73 for last year. This increase, taken together with the fact that out of 1,484 admissions for malarial fever only 3 were reported as of undetermined type, shows the increasing care taken by medical officers to make accurate diagnoses of the malarial fevers and to exclude from that heading all which can not be scientifically demonstrated to be such. The various diagnoses under this head are as follows:

Febricula.....	173
Simple continued fever, cause unknown.....	43
Fever, type undetermined.....	25
Ephemeral fever.....	48
Thermic fever.....	9
Continued fever, type undetermined.....	5
Total.....	303

CHOLERA.

These statistics are for enlisted men only, and consequently do not include the case of an officer who died at Camp Gregg, having become infected while on survey duty in the country.

Thirteen cases of cholera and 7 deaths occurred among American troops stationed in the Philippines. The chief surgeon in his annual report remarks in this connection:

Considering the serious epidemic which raged during the past season, this record speaks well for the sanitary precautions taken to prevent the spread of the contagion.

Cholera appeared during the present calendar year all over the archipelago, especially in the islands of Panay and Mindanao. Religious superstition and general ignorance to a great extent prevent the natives from reporting infectious diseases, such as bubonic plague, smallpox, and cholera, to the health authorities.

DYSENTERY.

The occurrence of this disease shows a diminution as compared with the year before, the admission rate being 26.23 as compared with 42.23 for the year 1907. The proportion of amebic to bacillary

infection was 3.31 to 1, as compared with 17 to 1 for the preceding year. The actual number of cases of amebic infection was 149, as compared with 369 for the preceding year, a diminution in this formidable infection which is most gratifying.

DENGUE.

There were 1,162 admissions for dengue, as compared with 738 for the preceding year. As this disease caused no deaths and had a very small constantly noneffective rate it constitutes rather an inconvenience than a sanitary danger.

BERIBERI.

One case of beriberi occurred in a white soldier during the year and no deaths. The immunity of American troops, both white and colored, to this infection, which is so formidable among the native troops, is a most interesting phenomenon. Its occurrence among the Filipino Scouts is discussed below.

YAWS.

There was one case of yaws in the person of a white soldier and no death.

TUBERCULOSIS.

The admission rate for all forms of tuberculosis was 6.18, being somewhat less than the preceding year, but about the average of the two preceding years.

VENEREAL DISEASES.

The admission rate, though very high, was considerably less than for the preceding year, being 289.62, as compared with 311.22 for 1907.

ALCOHOLISM.

The admission rate for alcoholism was 25.31, somewhat less than for the preceding year, which had a ratio of 29.23. The number of deaths, however, was 5, as compared with 1 for 1907. These figures do not include the loss of life caused by the distressing accident which occurred at Camp Keithley, Mindanao, whereby 28 men were poisoned with methyl alcohol, of whom 11 died. The following is the chief surgeon's report:

I have the honor to make the following special report concerning 28 cases of acute methyl alcoholism which recently occurred at this post:

The first case reported from the guardhouse about 9 a. m., the 15th inst., and it was soon learned that a celebration had taken place the previous night in M and L companies, with "Columbian spirits" as the exhilarator. The "Columbian spirits" was purchased from the post exchange on the afternoon of the 14th under various excuses and was mixed in a dish pan with milk and sugar. About 10 bottles are believed to have been purchased and consumed, in various quantities, by those admitted to sick report.

Immediately after the admission of the first case representation of the facts was made to the commanding officer, and company commanders were ordered by him to make immediate inspection of barracks and send all suspicious cases to hospital. This procedure ultimately resulted in producing the 28 cases on sick report and 4 light ones who reported that they had taken only a small quantity and who showed no symptoms of alcoholism. They were given a purgative and marked "duty."

Private D., the first case reported, was on special duty away from the observation of his company commander and had been drinking ordinary alcoholic beverages for

some days. He claims to have taken about 1,500 c. c. of the wood-alcohol punch and then lost count of the additional quantity. This man is still alive and bids fair to recover, though he will probably lose his eyesight.

Several of the men who have died claimed to have taken only one drink of the punch. All patients walked to the hospital and when examined a few of them complained of being "very sick," but most of them regarded the admissions to sick report rather in the light of a joke. When admitted, a few of them showed a considerable depression of circulation. All showed conjunctival congestion and all were more or less unsteady in locomotion.

Upon admission, each man was put to bed, given a drink of whisky, 50 c. c. magnesium sulphate, an enema, and strychnia stimulation was pushed to the limit. Hypodermoclysis of normal saline solution with adrenalin chloride was tried on four cases who subsequently died. Hot bottles and blankets were used to conserve heat, but as the cases progressed extreme restlessness developed and it took two men to keep one patient even partially covered.

In all cases the first serious symptoms were increased force and frequency of respiration, until respiration was costal as well as diaphragmatic and all the accessory muscles were in use. This respiratory disturbance was accompanied and followed by extreme restlessness and distress; then unconsciousness with bellowing expiration; then, in most cases, convulsion with cessation of bellowing expiration, supervention of coma, stertorous respiration, gradually slowing until cessation. In all fatal cases the pupil was widely dilated and without reaction and apparent blindness was present.

In most cases the heart's action became feeble and rapid about the time the disturbance of respiration commenced, but continued until the last gasp for breath. In one case the heart's action remained good until the convulsion occurred.

Gastric irritation was present to a slight degree in all except one case and in that (patient still alive) it was a prominent symptom, but this man had drunk "Columbian spirits" undiluted.

There seems to be practically no intestinal irritation.

Four men died within twenty-four hours and several more within forty-eight hours. Eleven deaths in all occurred within forty-eight hours. The other cases appear to be recovering. A further report will be made upon the ultimate result of the cases now in the hospital.

Commenting upon this, the chief surgeon of the department remarks:

This occurrence is an argument in itself for the restoration of the beer and light-wine features of the post exchange. It is believed that had these unfortunate men been accorded the privileges of ordinary citizens and allowed to purchase beer at the post, which is isolated, their lives would not have been sacrificed in this manner.

INSANITY.

The admission rate for insanity was 1.09, as compared with 1.88 for 1907 and 2.02 for 1906.

DIARRHEA AND ENTERITIS.

The admission rate for these diseases was 85.21, an increase over the preceding year, when the rate was 72.43, but better than the year 1906, when the rate was 130.69.

INFLUENCE OF STATION.

The Department of Luzon had the highest admission rate and the Department of Mindanao had the lowest. For deaths, the Department of Mindanao had the highest rate and Visayas the lowest. For total noneffective rate from sickness, Visayas had the highest rate and Luzon the lowest.

Causes of death, American troops, Philippine Islands.

Cause of death.	Number ratio per 1,000 of—		
	Deaths.	Mean strength.	Total deaths.
DISEASES.			
Tuberculosis (pulmonary, 11; miliary, 1).....	12	0.99	196.72
Cholera Asiatica.....	7	.58	114.75
Alcoholism (acute, 2; chronic, 2; delirium tremens, 1).....	5	.41	81.97
Organic diseases of the heart.....	5	.41	81.97
Typhoid fever.....	5	.41	81.97
Dysentery (amebic, 2; bacillary, 2).....	4	.33	65.58
Syphilis (secondary, 2; tertiary, 1).....	3	.25	49.18
Cancer.....	3	.25	49.18
Malaria fever (malignant remittent, 1; pernicious, 1).....	2	.16	32.79
Aneurism.....	2	.16	32.79
Pneumonia.....	2	.16	32.79
Sprue.....	2	.16	32.79
Nephritis (acute, 1; chronic, 1).....	2	.16	32.79
Erysipelas.....	1	.08	16.39
Tumor.....	1	.08	16.39
Diabetes.....	1	.08	16.39
Apoplexy.....	1	.08	16.39
Gastro-enteritis.....	1	.08	16.39
Appendicitis.....	1	.08	16.39
Undetermined.....	1	.08	16.39
EXTERNAL CAUSES.			
Gunshot wounds (homicidal, 7; suicidal, 5; accidental, 4).....	16	1.32	307.69
Drowning (accidental, 12; suicidal while insane, 1).....	13	1.07	250.00
Methyl alcohol poisoning.....	11	.91	211.54
Incised wounds (suicidal, 2; homicidal, 2).....	4	.33	76.92
Fracture of skull (accidental, 2).....	2	.16	38.46
Fracture of spine (accidental, 2).....	2	.16	38.46
Other traumatisms (homicidal, found murdered, 1; accidental, 1).....	2	.16	38.46
Dislocation cervical vertebra (accidental, 1).....	1	.08	19.23
Crushing (run over by railroad train, accidental, 1).....	1	.08	19.23
Total.....	113	9.31	1,000.00
Total diseases.....	61	5.03	539.82
Total external causes.....	52	4.28	460.18
Grand total.....	113	9.31	1,000.00

PHILIPPINE SCOUTS.

The following table shows the amount of sick for the year:

	From all causes.		Excluding injuries, venereal diseases, and alcoholism.	
	Total.	In hospital.	Total.	In hospital.
Ratios per 1,000 of mean strength:				
Admissions to sick report.....	1,057.62	818.09	848.67	.....
Discharges on surgeon's certificate of disability.....	10.38	.....	10.19	.....
Deaths.....	8.26	.....	5.38	.....
Total losses.....	18.64	.....	15.57	.....
Noneffective from sickness.....	35.11	29.61	28.59	24.50
Average number of days lost:				
For each soldier.....	12.85	10.84	10.46	8.97
For each case.....	12.15	13.25	12.33	.....

The admission rate is less than for the preceding year, being 1,057.62 as compared with 1,114.55. The total loss and noneffective rates are, however, higher for the present year, being 18.64 and 35.11 as compared with 14.32 and 28.57 for the preceding year. This anomalous condition with a lower admission rate and a higher death rate is due to the fact that while there has been a very considerable decrease in rates for malarial fevers, 236.97 as compared with 312.67; dysentery, 11.41 as compared with 23.94; venereal diseases, 56.05 as compared with 63.48; diarrhea and enteritis, 39.53 as compared with 54.07; and dhobie itch, 21.63 as compared with 33.34, there has been a very great increase in beriberi, a disease of long duration and causing a considerable death and discharge rate. The admission rate for this disease was 121.53, as compared with 24.58 for 1907. The actual number of cases was 618, as compared with 115 for the preceding year, and the numerical loss, deaths, and discharges 20, as compared with 9. The death rate was also further increased by 8 from gunshot wounds and 4 from drowning, the deaths from these two causes for the preceding year being 1 and 2, respectively. The causes of death are shown in the following table:

Cause of death.	Number of deaths.	Ratio per 1,000 of—	
		Mean strength.	Total deaths
DISEASE.			
Beriberi.....	7	1.35	241.38
Cholera Asiatica.....	4	.77	137.93
Tuberculosis (pulmonary 1, other organs 1).....	2	.38	68.97
Cancer.....	2	.38	68.97
Organic diseases of the heart.....	2	.38	68.97
Pneumonia.....	2	.38	68.97
Abscesses of the liver.....	2	.38	68.97
Malarial fever (malignant, remittent).....	1	.19	34.48
Smallpox.....	1	.19	34.48
Cholera nostras.....	1	.19	34.48
Syphilis, secondary.....	1	.19	34.48
Endocarditis, acute.....	1	.19	34.48
Gastro-enteritis.....	1	.19	34.48
Cirrhosis of the liver.....	1	.19	34.48
Biliary calculi (followed by gangrene of gall bladder and peritonitis).....	1	.19	34.48
Total.....	29	5.57	1,000.00
EXTERNAL CAUSES.			
Gunshot wounds (suicidal, 3; accidental, 2; in action, 1; homicidal, 1; resisting arrest, 1).....	8	1.54	571.43
Drowning (accidental).....	4	.77	285.71
Incised wounds (homicidal).....	2	.38	142.86
Total.....	14	2.69	1,000.00
Grand total.....	43	8.26	1,000.00

The principal differences from the preceding year are 4 deaths from Asiatic cholera as compared with 2; 2 deaths from tuberculosis as compared with 6; and no deaths from dysentery as compared with 3. The increase in deaths from gunshot wounds and drowning has been noted above.

Excluding injuries, venereal diseases, and alcoholism, over which causes of admission the seasons have little or no influence, the highest admission rate is in March and the lowest in December.

The highest constant noneffective rate, however, is in August, and the lowest in January.

The most notable difference in discharges for disability from the preceding year is in the number of discharges from beriberi—13 as against 3. This, in great part, accounts for the increased total of 53 as compared with 39.

The lowest death rate was the same for April, May, July, and August, which were all months of a high constant noneffective rate, 30.27 to 33.34. The highest death rate was in February, and corresponded with a low constant noneffective rate.

RECRUITING.

The results of the examinations of applicants for enlistment in the Philippine Scouts are given in the following table and are of interest as showing the anthropometrical characteristics of the Filipino races. The proportion of recruits accepted is about the same as for 1907 and the number was somewhat less.

Examination of Filipino applicants for enlistment during 1908.

	Number.	Ratio per 1,000 examined.
Examined by medical officers.....	2,761	1,000.00
Accepted by medical officers.....	2,506	907.64
By first enlistment.....	1,340	485.33
Other enlistments.....	1,166	422.31
Rejected by medical officers.....	^a 232	84.03
Declined.....	23	8.33

^a Of this number 5 were rejected for causes not physical.

The weight of 82 per cent of all recruits is under 128 pounds, the minimum weight for American recruits.

Fifty-two per cent of all recruits were 5 feet 3 inches or under; that is, below the minimum standard for American soldiers.

The minimum chest measure for American recruits is 32 inches at expiration. Sixty-three per cent of all Filipino recruits have a chest measurement below this limit.

Defects of vision, which in 1907 constituted the principal cause for rejection, have for 1908 fallen to the eighth place. In spite of the low standard of weight required for these troops, 43 being accepted with a weight of 99 pounds or less, it is seen that under weight is the largest cause of rejection; heart disease being second, with a rate of 123.35, as compared with 87.99 for American soldiers.

PREVALENCE OF DISEASE BY RACES.

In making this comparison it is to be borne in mind that the native troops were serving in their own country under conditions natural to them, but inimical to our troops, and that American soldiers excused from any portion of their military duty, no matter how trivial the cause, are placed on sick report, while this is not the case with the Philippine Scouts.

The admission, constant noneffective, and death rates were much lower for Filipino than for American troops serving in the Philippines, but the discharge for disability rate was 10.38 for the former and 8.65 for the latter.

The following table indicates the relative susceptibility of the two races to the diseases noted:

Comparative morbidity of races.

Disease.	Admission rates.			
	American troops.			Filipino troops.
	Total.	White.	Colored.	
Venereal diseases.....	194.13	186.35	348.08	56.05
Tonsillitis.....	55.58	57.32	21.00	4.52
Diarrhea and enteritis.....	53.27	53.15	55.68	39.53
Furuncle.....	32.90	31.93	52.18	23.60
Influenza.....	29.91	31.17	4.77	3.74
Alcoholism.....	29.42	30.32	11.45	.98
Muscular rheumatism and myalgia.....	26.40	25.63	41.68	18.09
Dengue.....	18.41	11.82	148.90	11.01
Measles.....	16.11	16.78	2.86	.00
Articular rheumatism, acute and chronic.....	14.01	13.86	26.72	5.31
Appendicitis.....	4.48	4.56	2.86	.20
Typhoid fever.....	3.29	3.42	.64	1.77

Disease.	Filipino troops.	American troops.		
		Total.	White.	Colored.
Malaria.....	236.97	46.33	45.55	61.72
Beriberi.....	121.53	.02	.02	.00
Bronchitis, acute and chronic.....	42.08	34.26	33.69	45.50
Dhobie itch.....	21.63	4.48	3.77	18.45
Dysentery.....	11.41	7.34	6.75	19.09
Tuberculosis, all.....	6.49	4.51	4.35	7.64
Pneumonia.....	2.75	2.11	2.14	1.59
Asiatic cholera.....	.79	.21	.14	1.59
Smallpox.....	.39	.23	.19	.95

The rates for diarrhea and enteritis, dysentery, and dengue all were higher among American troops, as was the case last year also. Tuberculosis is this year greater among the Philippine Scouts.

The excessive prevalence of malaria among the Filipinos, ratio of 236.97 as compared with the admission rate among the American troops of 123.97, shows the efficacy of the greater care in protecting the latter by the screening of buildings and providing of mosquito bars, in spite of the natural greater susceptibility of the whites, which compose the great majority of the American troops in the Philippines.

The great prevalence of beriberi among the Philippine Scouts as compared with the almost entire absence of the disease among the American troops, is believed to be due principally to a difference in racial susceptibility, although in the absence of any definite knowledge of this most puzzling disease, this must be regarded as an assumption rather than a statement of fact.

Beriberi occurred at 26 posts, the greatest number being at Camp Gregg. The surgeon reported as follows to the chief surgeon, Department of Luzon, concerning the outbreak at that post:

In compliance with paragraph 442 (M. M. D., 1906), I have the honor to submit the following report of an epidemic of beriberi at this post from July 2, 1908, to May 15, 1909:

There were a total of 61 cases, and of these 18 were readmitted at least once during the course of the epidemic. All the cases were among native troops. Fifty-eight cases occurred in the Fifth Battalion of Philippine Scouts, and 3 cases in the

Seventh Battalion shortly after its arrival at this station from Mindanao, between February 19 and March 13, 1909.

All were returned to duty with the exception of 2, 1 of whom was discharged on surgeon's certificate of disability for disability resulting from beriberi, and 1 was discharged for disability resulting from loss of right thumb. The latter had recovered from beriberi when discharged.

In the cases occurring in the Fifth Battalion the disease apparently originated at this post. The last case in the Fifth Battalion occurred on December 5, 1908, and there were no further new cases until March 15, 1909. These new cases originated in the Seventh Battalion shortly after its arrival from Mindanao for permanent station here. These last 3 patients stated that they first noticed symptoms of beriberi about March 8, 1909, while on the transport en route from Mindanao, and it would seem that the disease originated in Mindanao.

The greatest number of cases occurred during July, 1908, the first month of the outbreak, when there were 23 cases. There was a steady decline during the succeeding months until in December, 1908, when there was but 1 new case admitted. There were no new cases from December, 1908, until March, 1909, when the 3 new cases in the Seventh Battalion mentioned previously came on sick report. There have been no new cases since those admitted in March, 1909.

The requirements of General Order 115, Headquarters Department of Luzon, series 1908, were complied with. After the first month the disease gradually declined. The last 3 cases did not present any indications for medication, and none was given, and after a short while were returned to duty.

There were no deaths.

Col. L. M. Maus, chief surgeon of the Department of Luzon, believing that the evidence in support of the theory of contagion, or place infection, was sufficient to warrant the measures of careful isolation and disinfection, he procured the issue of an order enjoining these. (G.O., 115, Headquarters Department of Luzon, Aug. 6, 1908.) It was ordered that patients be moved out of the buildings in which the disease was contracted and treated in dry, sunny buildings or hospital tents with floors raised at least 1 foot above the ground. Upon the occurrence of a case of beriberi in the command, the building and property of the patient was carefully disinfected, and all the property of the command was exposed to the sun for at least four hours. All cases of suspects were isolated and quarantined until fit for duty, and upon being returned to duty their persons and clothing were washed with a disinfectant.

Lieut. H. C. McLeod, Medical Reserve Corps, called attention to the fact that Baelz had found that indican was present in large amounts in the urine of all patients suffering from beriberi. Lieutenant McLeod therefore assumed that all cases of beriberi suffered from proteid putrefaction in the intestines, due to the greatly increased and more highly proteid ration which the Philippine Scout received in the military service, as compared with that to which he was accustomed. It will be observed that this theory is directly at variance with that of Takaki.

The board for the study of tropical diseases, to which the report of Lieutenant McLeod was submitted, concluded, after a discussion of the causes of indicanuria in the disease, as follows:

With these facts in view, it is but reasonable to suppose that increased proteid decomposition, with the presence of indican in the urine in increased quantity, is a result of the disease rather than a causative factor. * * *

Of the many theories regarding the cause of beriberi, the one which appeals to us as the most likely is that it is a specific germ disease, the causative organism gaining entrance to the system through the medium of rice, and causing a primary lesion of some portion of the gastro-intestinal tract, the neuritis being resultant of a toxin generated by this organism. The theory advanced by Lieutenant McLeod is so opposed to experience with the disease that it is not considered advisable to pursue investigation along the line indicated.

The whole question of beriberi is so baffling that it is thought that when the personnel of this board is changed this disease should be assigned to it as a subject for investigation for the year or two years for which the new members will be detailed. The present board is so involved in the details of colored underclothing experiment that it would not be able to devote proper time to this important disease.

A statement of the lines upon which the work has been begun is given below in mentioning the reports received from this board.

A case of leprosy developed during the year covered by this report in the person of a Philippine Scout of the Forty-ninth Company at Camp Hayt, Samar. He was under observation from January 8, 1908, and was discharged on surgeon's certificate of disability on September 6, 1909.

A case of leprosy in the person of a white American soldier of the Twenty-sixth Infantry is mentioned in the report of the chief surgeon, but does not appear in the tabular statement of diseases because the diagnosis was made after the end of the calendar year. He states that a swelling in the soldier's right hand was first observed in 1903. This soldier has had much tropical service, having arrived in the Philippines in July, 1898, and remained until November, 1899. He served in Porto Rico from March to November, 1900, returning to the Philippines in June, 1901, and remaining until December, 1905. He returned to the Philippines in July, 1907, and, in view of his diagnosis, will probably have to remain there for the rest of his life unless the establishment of a government leprosium in the United States should make it possible for him to be brought home for treatment.

SANITATION IN THE PHILIPPINES.

The chief surgeon of the Philippines Division, Col. L. M. Maus, Medical Corps, in his report for the year 1908 has the following to say with regard to general sanitary questions:

Sanitary conditions, in general, of all posts are good considering the primitive condition of many of the buildings and the lack of modern methods of sanitation. The construction of most posts, in regard to architecture and material, are practically identical, except as to their sizes, and consist of one-story pavilion barracks and bungalows, constructed of rough, unplanned, battened pine lumber, with rubberoid and galvanized-iron roofs. The windows and doors are very crude, and the buildings are so open that protective wire screening at present against malaria and dengue would be practically impossible. Troops serving at permanent posts in the Philippines should be provided with two-story reenforced concrete quarters, the dormitories being invariably on the second floor. These buildings should contain ample space for kitchens, mess halls, amusement rooms and libraries, offices, storerooms, etc., with broad concrete piazzas, both above and below, around the entire building. The upper piazza should be entirely inclosed in 18-mesh gauze, besides the doors and windows of the building. With such precautions it is possible to keep the men practically free from malarial infection, for the reason that the anopheles are night mosquitoes and rarely do any harm during the day.

DISPOSAL OF EXCRETA.

Excreta, except at the few posts having sewer systems, is disposed of by means of a dry-earth system on a modified form. Sewer systems should be installed at all permanent posts.

Crematories of suitable capacity should be provided at all permanent posts, in order to dispose of slops, garbage, stable manure, and other rubbish; also for the disposal of night soil at posts not supplied with a sewer system.

WATER SUPPLY.

Boiled or distilled water is used at most posts in the division. At Fort William McKinley, Camp Stotsenburg, and Macabebe water is obtained from artesian wells. At Camp Eldridge the water is piped to buildings direct from a mountain stream. It is recommended that artesian wells be drilled at all permanent posts in the division not already supplied with such wells.

FOOD SUPPLIES.

With the exception of the flour, little or no complaint has been heard from any of the commands on the score of poor food during the year. Owing to their isolation it was impossible to ship ice and fresh meats to some of the posts. The rations appear suitable and the men well nourished.

CLOTHING.

The khaki clothing furnished troops for the Philippines is very suitable. The same may be said of the foot gear. For the rainy season the felt fatigue hat serves a good purpose, though, like the khaki cap, it is not adapted to the dry, hot season. It is my opinion that a ventilating band, one-fourth of an inch thick, should be placed inside of the fatigue hat at the brow band, to admit of the circulating of air around the head. The crown of the hat should be also an inch higher, with ventilators on the side. The crown of the hat should be worn also in the form known as the "Montana peak," instead of the crease. For the hot, dry season a light-weight khaki helmet, with brow and crown ventilators, would prove far more productive of health and comfort than the present head gear, and no doubt, in many instances, avert headaches and slight attacks of heat stroke.

SANITARY RECOMMENDATIONS.

The recommendations in the sanitary reports relate mainly to the necessity of establishing sewer systems and systems of pure water supply and to the leaks and other defects in the temporary barracks, quarters, and hospitals which are occupied at most of the posts.

TYPHOON.

On September 23, 1908, a typhoon is mentioned as having destroyed most of the buildings at Tagabiran, Gandara, Borongan, and Camp Hayt on the Island of Samar, and Tolosa on the Island of Leyte, causing much discomfort to the garrison, especially to the women and children.

SCREENING OF BARRACKS.

Much work has been done during the year in the way of screening the more permanent barracks and quarters as a protection against mosquitoes, and the great sanitary value of this work is shown by the steady reduction in the admissions for malaria. It is of greatest importance from a sanitary point of view that the nipa constructions, which can not be satisfactorily screened, should be replaced by permanent buildings with screened verandas, along the lines recommended by the chief surgeon in his report just quoted.

SEWERAGE.

Until the sewers can be placed in the many posts that now lack them the substitution of McCall incinerators for less satisfactory methods of disposal of excreta, as recommended in my last annual report, should be hastened.

WATER SUPPLY.

The success of the army in protecting itself against Asiatic cholera and dysentery, in spite of the unsatisfactory character of the water supply at many of the posts, is a most creditable evidence of the conscientious care taken in sterilizing the water and the precautions against contact infections.

CAMPAIGN HAT AND KHAKI CAP AND ORANGE-COLORED UNDERWEAR.

The surgeon (Fort William McKinley) in his sanitary report for August, 1908, makes the following recommendations:

A suitable, well-ventilated helmet should be used, except in field service, where campaign hat is indicated. The hat does not protect the back of the head and neck, and very slightly the eyes from the glare of the sun. The temperature of the surface of the head under the hat is above that under the helmet, and in a good many cases the individual suffers from headache which is relieved by use of the helmet.

The surgeons at Borongan and Camp Gregg also found fault with the campaign hat, and especially with the khaki cap, and they recommend the adoption of a light helmet.

An investigation by the board for the study of tropical diseases of the value of orange-colored underwear for the exclusion of the short actinic rays of sunlight, which according to a theory which has recently attracted much attention are injurious to the health, is described by the chief surgeon in his annual report as follows:

On December 27, 1907, the Inspector-General of the Army addressed a letter to The Adjutant-General submitting extracts from annual report of the inspector-general, Philippines Division, in regard to the value of orange-red underclothing as a protection from the effects of the tropical sun, and recommending that 5,000 suits of such garments be sent to this division for a trial. The recommendations were approved, and in due course the correspondence reached this office, for the drawing of a plan for the experiment, as recommended by the Surgeon-General. In consultation with the members of the board for the study of tropical diseases the chief surgeon drew up a scheme for the proposed experiment, supervision of which was to be by the board. This plan, which was approved by the division commander, provided for a test upon approximately 1,000 men, half of whom were to wear the colored underclothing, the other half to wear white underclothing of similar weight, to serve as controls.

Organizations having over a year to serve in the division were selected to furnish the subjects for the test, the First Cavalry at Camp Stotsenburg, the Fifth Artillery at Camp Jossman, and the Twenty-third Infantry at Zamboanga, thus taking in each branch of the service and each department. A medical officer was designated at each of these posts, who was to have charge of the details of the experiments, and who was to stay with the selected organizations during its course. In addition to organizations, all officers in the division were invited to supply themselves with the underclothing and to submit a report thereon after a thorough trial.

The underclothing arrived in December and has been issued to the troops selected. The success of the experiment was somewhat jeopardized by the large percentage of small sizes of underclothing sent. This has necessitated a selection of men not contemplated in the plan; but it is not thought that this will greatly interfere with a conclusive test.

The plans for the experiment contemplate a comparative record of strength and blood-pressure tests of pulse, respiration and temperature after fatigue, practice marches or drills, of all symptoms referable to the effect of the sun after exposure thereto, and a measure of anemia by red and white blood corpuscle counts, differential leucocyte counts, and hemoglobin estimations. Special tests will be carried out upon a small number of men in addition.

Experimental work upon the effects of heat and light upon small plant and animal life is also contemplated. The experiment is now in full progress, and it is thought that some conclusive evidence will result.

The campaign hat is at any rate free from the reproach of admitting the actinic rays of light, since recent experiments with sensitive photograph plates have demonstrated that it is quite impervious to them, and no additional protection is, therefore, added by an orange-colored lining.

This hat would undoubtedly, however, be much more comfortable and appropriate for the Tropics if some form of ventilated hatband were provided.

TRANSPORTS.

SANITARY CONDITION.

The sanitary condition of the various transports and the accommodations provided for troops on them has been in the main satisfactory, and the sanitary faults which have arisen from time to time have been corrected with promptness.

Outbreaks of mumps and measles occurred on some of the transports, but they were in all cases promptly isolated, and the infection was as a rule successfully combated.

During the voyage of the *Buford* from Manila to Nagasaki in October, 2 cases of cholera developed. The first case reported thirty-six hours after leaving Manila and died the same day. A few hours after the death of the first patient the second case developed and was transferred to the Quarantine Hospital at Nagasaki and the ship disinfected. Both cases were thought to have been infected at Manila.

In the voyage of the *Buford* from San Francisco to Manila in February, 30 cases of measles and 10 of mumps occurred. On the voyage of the *Thomas* from Manila to San Francisco, arriving at the latter port May 12, 1908, 51 cases of measles and 12 of mumps developed.

Two cases of smallpox developed on the transport *Sherman* between May 22 and June 12, 1908, while en route from Manila to San Francisco. The second case was believed to be a contact from the first. The first case died and the second was transferred to the Quarantine Hospital at Astoria, Oreg.

Two cases of Asiatic cholera appeared on the transport *Sheridan* on September 15 and 16, respectively, while at Mariveles, P. I. It is believed that these infections were contracted in Manila.

During the year 1908, 3,443 enlisted men were transported from the United States to the Philippines, and 4,097 were returned to the United States from the Philippines; also 817 were transported to Alaska, and 517 returned from Alaska to the United States.

BOARD FOR THE STUDY OF TROPICAL DISEASES.

During the year 1908 the board was composed of Capt. William N. Phalen and Lieut. Henry J. Nichols. Since the end of the year Maj. W. P. Chamberlain and Capt. E. D. Kilbourne have been added to the board.

The board has made during the year a number of very interesting reports of its investigations, several of the more important of which have been already published.

FILARIASIS.

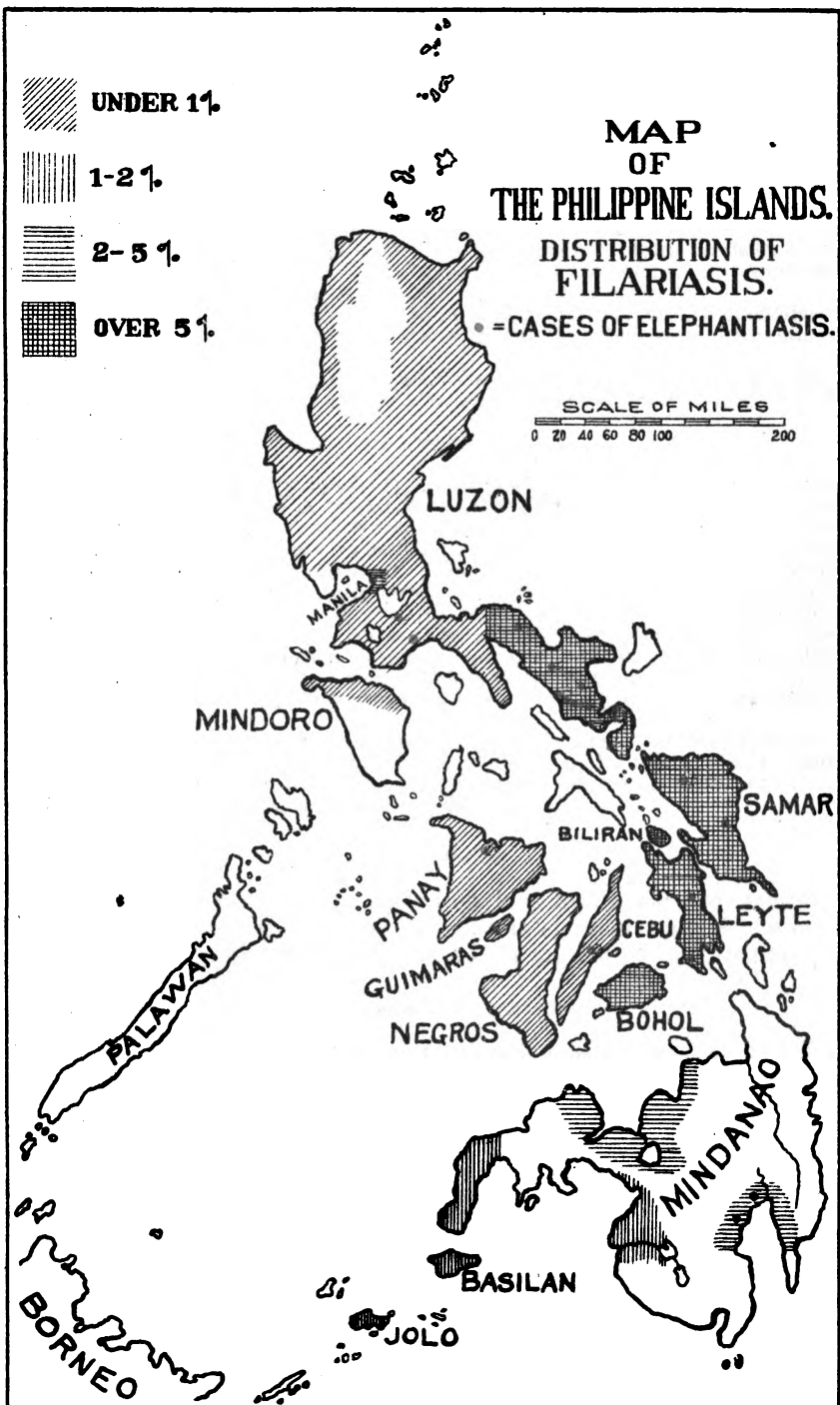
A very extensive and laborious study of the distributions of the filarial infection has been made, including examinations of nearly 6,400 individuals, with positive findings in 127, showing nearly 2 per cent of infection for the islands. The localities covered by these infections embrace nearly the whole of Luzon, the upper islands of Visayas, the northern end of Mindoro, and scattered sections near the coast of Mindanao.

Distribution of Filaria nocturna in the Philippine Islands.

Source.	Number examined.	Infected.	
		Number.	Per cent.
Ilocanos (Ilocos Norte, Ilocos Sur, and Union).....	1,019	6	0.58
Cagayan (Cagayan, Isabela, Infanta, and Nueva Vizcaya).....	394	1	.26
Pangasinans (Pangasinan, Tarlac, Nueva Ecija, and Zambales).....	374	0	.....
Pampangans (including Macabebes).....	1,140	1	.09
Tagalogs (Bulacan, Rizal, Cavite, Laguna, Batangas, Tayabas, and Mindoro).....	399	2	.53
Tagalogs in Manila.....	292	13	4.4
Bicol (Ambos Camarines, Albay, and Sorsogon).....	365	37	10.1
Inhabitants of—			
Bohol.....	27	2	7.4
Cebu.....	519	3	.57
Leyte.....	253	20	7.8
Negros.....	131	2	1.5
Panay.....	536	4	.74
Samar.....	141	4	2.8
Cotabato.....	390	4	1.3
Lanao and Misamis.....	191	9	4.7
Zamboanga.....	172	2	1.25
Davao.....		15	.....
Miscellaneous.....	41	0	.....
American negro soldiers.....	420	2	.48
Total.....	6,804	127	1.87

The enlisted personnel of the Philippine Scouts furnished 483 subjects for examination, the remaining number being made up of house servants, quartermaster's employees, the inmates of provincial jails, and others from whom blood specimens could be obtained. The colored soldiers had all been serving in the Cotabato district of Mindanao for over a year before the examinations were made. One of those found infected was from Charleston, S. C., where cases of filariasis are occasionally seen, and the other was from Porto Rico where the disease is common. It is doubtful, therefore, where these men became infected, but as the Porto Rican had been in the Philippine Islands only five months when the parasite was found, and the two men had served together in the same company for two years, it is possible that the Porto Rican was infected in his own country and was the source of infection for the other case.

In order to see whether this disease had involved the white American troops, an examination was made of the blood of 250 American soldiers and of the Twenty-sixth Infantry and the Hospital Corps, who had been stationed for eighteen months at Camp Daraga, Albay, in the most highly infected filarial district of the islands. Contrary to expectation, no case of infection was found, although the percentage of filariasis in the province of Albay is about 10 per cent among



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the entire population. The board interprets this as evidence that with ordinary precautions the protection of white people from filariasis is not difficult.

As regards the identification of the filarial parasites and the practical conclusions to be drawn from a study of the distribution, the board says:

Only a small number of the cases seen or reported have been studied with a view to the identification of the parasite. Such as we have studied, however, have shown embryos fulfilling the requirements of the micro-filaria Bancrofti, perhaps more widely known as the filaria nocturna. No specimen of the adult worm has been seen, so that identification has been made wholly by means of the embryo. No example of the filaria philippinensis of Ashburn and Craig has been observed.

From the southern islands medical officers of the army have reported a microfilaria without a sheath and with apparently diurnal periodicity, but these observations have not been verified.

Of the filaria of the lower animals, the filaria immitis of the dog and a filaria analogous to the filaria loa of man, but parasitic in the horse, are known to occur here. * * *

PRACTICAL CONSIDERATIONS.

Since filariasis possesses such disastrous potentialities, it should be incumbent upon us to take precautions against it, especially in sections where it is known to be most prevalent. These precautions are not difficult, and as the protection from mosquitoes is one of the prime requisites, and is a matter quite as much of comfort as of safety, this measure is usually fairly well carried out. The other measure, also very easy, is the examination at night of the blood of the house servants for the parasite, and the prompt discharge of any that are found infected. No consideration should suffice to keep a subject harboring filariae about the house of an American or European. Any measure of protection for the mass of the Filipino people must be hopeless, unless possibly a mosquito crusade covering the whole islands were undertaken, but the energy of such crusades is usually too quickly dissipated to avail much against such a persistent disease.

The investigation of the Philippine Scouts will probably result in the discharge of the infected individuals, and the examination of the blood for filariae, of applicants from areas which have shown a high percentage of infection, required as a part of the examination for enlistment in that branch of the army.

ELEPHANTIASIS.

A very unusual number of cases of chylous hydrocele and elephantiasis of the scrotum were found, as well as elephantiasis of the legs and varicose groin glands, by the board during the visit to Samar.

. BLASTOMYCOSIS OF THE SKIN.

In accordance with instructions from this office to make a special study of the parasitic diseases of the skin and to isolate and cultivate the fungi causing them, the board has made a very interesting study of these conditions. Their conclusions are as follows:

In the Philippines a blastomycotic infection of the skin is one of the common skin diseases. It exists in at least three forms, two of which are milder than those seen in the United States. It is usually unrecognized, in milder forms passing as ring-worm or some form of dhobie itch; in severer forms as tuberculosis or syphilis. The milder forms yield to local antiseptics, the more chronic and sever only to potassium iodide internally. Further development of the subject will be necessary before these forms, as well as those found in horses, in ulcers, in sprue, and in hill diarrhea, can be definitely classified.

The report gives in full the clinical peculiarities of the three types and the cultural peculiarities of the fungus which appear to be identical in all the types.

PSILOSIS.

In view of the suggestion of Dantec that this disease was due to infection of the intestinal tract by fungi allied to the blastomycosis, and having found a great quantity of these organisms in the stools of two cases of hill diarrhea, the board instituted careful examinations of the stools of all cases of sprue that could be obtained. While blastomycotic forms were found in many of these cases, neither they nor any other fungi were constant. Acid fast yeasts were found with considerable frequency, but were also found in other diarrheas and at times in normals also.

The board found the cases stated to show every gradation between chronic diarrhea, with perhaps nothing more than flatulence to suggest sprue, up to the classical types of the latter disease.

The so-called "hill diarrhea" of Baguio was found to be especially prone to be followed quickly by symptoms of psilosis.

The treatment of sprue with milk inoculated with lactic-acid bacillus has proved of marked value.

UNCINARIASIS.

The board comments on the great frequency of the hook-worm infections in the Philippines and the comparative scarcity of clinical symptoms referable thereto. They conclude that the clinical manifestations are largely a question of the number of parasites existing in the patient. In 20 autopsies made upon native subjects, 75 per cent showed hook worms, but in only one case did the number exceed 20, and in this case the number was not more than 60. The mild influence of the infections usually found in natives of the Philippines as compared with the very grave types seen in Porto Rico is believed to be due largely to the great opportunities given by the mode of life of the latter for repeated and heavy infections.

In an examination of 528 white American soldiers of the Eighth Infantry, 48, or 9.09 per cent, were found to be infected with hook worms. As these men do not go barefoot and gave no history of antecedent, it is difficult to see how the infection could have taken place through the skin, and the inference is, therefore, that even if the skin is the usual route of hook-worm infection it is by no means the only or even the usual route among white men.

PARAGONIMIASIS.

In addition to the 4 cases of pulmonary paragonimiasis given in my last annual report, 9 additional cases are reported, one of them in the American Army. All came from the island of Samar, and the board concludes that the upper Gandara Valley is an endemic area for this disease, and the same is probably true for the whole interior island. Repeated efforts by Ford to infect a monkey with this parasite failed.

SCHISTOSOMIASIS.

A case of this disease additional to that mentioned in my last report was discovered in the person of a Philippine Scout who died of beriberi. Eggs of *Schistosomum japonicum* were found in large

numbers in the connected tissues of the liver, colon, and appendix. Both cases occurred in the Catubig river valley, in northern Samar.

The experience of the board is in harmony with reports recently published of the result of the examinations of over 4,000 Bilibid prisoners, which showed a great preponderance of trematode infections from the islands of Samar and Leyte.

DENTAL AND ORAL DISEASES.

The number of dental operations during the year was 45,841, being an increase over the preceding year, for which the number was 39,362. The ratio per thousand of mean strength was also slightly greater, being 700.87, as compared with 673.06. This, however, can not be taken as a measure of the movement of dental diseases in the army, because, as stated elsewhere in this report, the number of dental surgeons is entirely too small to furnish treatment for the army and many cases requiring treatment must necessarily be neglected or treated by civilian dentists.

MEDICAL DEPARTMENT.

The Medical Department consists of a Medical Corps, a Medical Reserve Corps, the Hospital Corps, the Nurse Corps, and the Dental Surgeons now authorized by law.

MEDICAL CORPS.

Authorized strength, June 30, 1908.....	356
Increase, January 1, 1909, by act of April 23, 1908.....	34
Authorized strength, June 30, 1909.....	390
In service, June 30, 1908.....	301
Appointed during year.....	6
	307
Losses during year.....	24
In service, June 30, 1909.....	283

Twenty-nine officers of the Medical Reserve Corps who successfully completed the course of study at the Army Medical School and were found qualified for appointment in the Medical Corps were commissioned about the close of the year. Only 2 of these had accepted by June 30, the date of the above tabulation. The 27 others have accepted since that date.

Losses during the fiscal year.

	Brigadier-general.	Colonels.	Lieutenant-colonels.	Majors.	Captains.	First lieutenants.	Total.
Retired.....	1	2		6	4	4	17
Resigned.....					1		1
Discharged.....					5		5
Died.....				1			1
Aggregate.....	1	2		7	10	4	24

The following promotions were made: One colonel to be surgeon-general, with rank of brigadier-general; 5 lieutenant-colonels to be colonels; 8 majors to be lieutenant-colonels; 28 captains to be majors; 4 first lieutenants to be captains; 1 major's place remains to be filled by promotion.

Increased inducements to enter the Medical Corps, provided by the act to increase the efficiency of the Medical Department, approved April 23, 1908, and the recent increase in pay for the army at large have resulted in a considerable increase in the number of candidates appearing at the preliminary examinations for that corps. Before the approval of the act in question, recruiting for the Medical Corps was very disheartening work, as there was so little to offer prospective candidates in the way of pay and promotion. The year before the approval of this act but 10 physicians were obtained to attend the Army Medical School preliminary to being commissioned in the Medical Corps if they demonstrated their fitness therefor. Last year, after approval of the act cited above, 33 candidates were secured and 29 were finally commissioned as compared with 10 the previous year. Constant and systematic efforts to obtain candidates at the various centers of medical learning were responsible in part for this result; nor is it probable that at any future time will it be possible to get sufficient candidates for the Medical Corps except through similar efforts. The distinguished physicians who head the Medical Reserve Corps have been a potent factor in this result, many of them through the interest created by their being members of the army medical service interesting themselves in obtaining desirable candidates, principally from the medical schools and hospitals with which they are personally associated. In fact, if no other benefit resulted to the army from commissioning the leaders of the medical profession of the country in the Medical Reserve Corps, it is safe to say that the desirable candidates obtained by and through them demonstrates the wisdom of such action. While the increased number of candidates for the Medical Corps is extremely gratifying, the fact should not be overlooked that the number of medical officers in the service—310, including those found qualified but not yet commissioned—is still 12 below the number allowed under the old organization and 135 below the number allowed under the present law when the total increase is legally available, which will be in 1911. It is now apparent that the Medical Corps can not be filled by that date. In fact, to fill all of the vacancies which will be created by the following year will require nearly 60 approved candidates each year at the preliminary examinations for the next three years. To secure so many will require earnest and continued efforts.

It will be noticed that 24 medical officers have been lost during the year. This is double the number lost during the preceding year. This increase is also partly due to the act to increase the efficiency of the medical department. It will be noted that 5 captains have been discharged. At the last session of Congress an amendment to the act for the support of the army modified the law in reference to the promotion of majors of the Medical Corps to the grade of lieutenant-colonel. Now such officers are reexamined at the end of one year in case they fail at their first examination for promotion. If successful at the second examination they are promoted; if unsuccessful, retired, with the grade of major, and if found physically

disqualified they are promoted and retired. Of 5 majors of the Medical Corps to which this law is at present applicable, 1 has already asked for retirement at the expiration of thirty years' service, 1 has been found physically disqualified and will be retired with the next higher grade as soon as a vacancy occurs, and 1 has been found professionally disqualified and retired with the grade of major; the other 2 have not yet been examined. The effect of the act reorganizing the Medical Corps, in so far as it modified the method of examination for promotion and extended it to a higher grade, has put into operation an effective system of promotion by elimination which can not fail to be of the utmost value in increasing the efficiency of the corps.

MEDICAL RESERVE CORPS.

Appointed during year.....	391
Losses:	
Discharged.....	17
Died.....	4
Commissions vacated.....	6
	<hr/> 27

On roster June 30, 1909..... 364

The four deaths were:

Julius A. Escobar, drowned, November 15, 1908, at Imus, Cavite, P. I.
 Andrew J. McCosh, died December 2, 1908. (On inactive list.)
 John M. Shepherd, died December 11, 1908, at Salt Lake City, Utah.
 William F. Bull, died February 22, 1909. (On inactive list.)

Of the 364 on the roster June 30, 184 were on active duty and 180 on the inactive list.

Ordered to active duty during year.....	217
Relieved from active duty.....	10
Commissions vacated.....	6
Honorably discharged.....	15
Died.....	2
	<hr/> 33

On active duty June 30, 1909..... 184

As noted above, 29 successfully completed the course of study at the Army Medical School and were found qualified for appointment in the Medical Corps.

The hopes expressed in last year's report that the patriotism of numbers of distinguished physicians would operate to induce them to head the Medical Reserve Corps have been amply justified by the outcome. The list of these gentlemen, now on the inactive list of the Reserve Corps, contains many names which are well known in scientific circles throughout the world. As a practical example of the value of the services of these officers, it has been noted that when it was necessary to assemble a board to investigate the important subject of inoculation for typhoid fever it was possible to do so without going outside of the Medical Reserve Corps, while at the same time it is doubtful if a better qualified board could have been assembled in this or in any other country.

During the year, with very few exceptions, all officers of the Medical Corps and of the Medical Reserve Corps have performed their duties in a satisfactory manner.

CONTRACT SURGEONS.

In service June 30, 1908.....	19
Contracts made.....	27
	<hr/>
	206
Contracts annulled.....	192
	<hr/>
Remaining in service June 30, 1909.....	14

Four of these 14 are temporary contracts and 10 are on duty at arsenals and headquarters of military departments, at pay ranging from \$75 to \$150 per month.

The latter devote but a portion of their time to professional attendance on the army personnel at the places where they are employed. They are commissioned in the Medical Reserve Corps, but in the interests of the Government are employed and not placed on duty as officers. The 4 contract surgeons temporarily employed are at stations from which medical officers are temporarily absent. This can not always be avoided, with medical personnel at its present strength.

DENTAL SURGEONS.

Contracts authorized and in service June 30, 1908.....	31
Contracts made.....	3
	<hr/>
	34
Contracts annulled.....	3
	<hr/>
Remaining in service.....	31

The number of dental surgeons employed during the year has been the number allowed by law. This number has not, however, proved adequate to the present strength of the army, and it is quite certain that the present number of dental surgeons is inadequate except to furnish treatment of a temporary or first-aid character. The law authorizing the employment of dental surgeons names 1 to 1,000 of authorized strength as the maximum limit of number. The proportion of dental surgeons to the strength of the army at present is 1 to 2,740. The 31 dental surgeons of the army during the year 1908 treated 44,479 cases, being an average of 1,445 patients a year, or 4.6 for each working day. As a number of working days are spent in travel, the number actually treated each day is presumably somewhat larger.

All the bills introduced with reference to the dental service of the army have mentioned a proportion of 1 dental surgeon to 1,000 of authorized strength as a maximum limit of number. This would provide, at the present strength of the army, 85 dental surgeons, which would allow one at each post of four or more organizations in the army.

The most recent bill for dental surgeons in the navy provides 30, which is in the proportion of 1 for about 1,500. There is no doubt that the largest figure of 1 to 1,000 would be ample, and it is probable that the naval proportion, which would allow for the army 57, would meet the pressing needs of the service. To give each man in the service one treatment a year would require a corps of 60, and to ask for a sufficient number of dental surgeons to do this seems certainly not to err upon the side of extravagance. It is recommended that this number be allowed.

HOSPITAL CORPS.

At date of last report, June 30, 1908, the strength of the Hospital Corps was as follows:

Sergeants, first class.....	277
Sergeants.....	297
Corporals.....	17
Privates, first class.....	1,480
Privates.....	1,460
Total.....	3,531

Since then it has gained—

By enlistment.....	835
By transfer.....	699
Return from desertion.....	102

And lost during the same period—

By discharge by expiration of term of service.....	1,030
By discharge by order.....	175
By discharge, sentence general court-martial.....	123
By discharge, surgeon's certificate of disability.....	58
By transfer to line.....	67
By retirement.....	18
By death due to disease.....	16
By death due to suicide.....	2
By death due to drowning.....	2
By death due to accident.....	1
By desertion.....	213
Dropped.....	1

Leaving in service June 30, 1909—

Sergeants, first class.....	299
Sergeants.....	290
Corporals.....	18
Acting cooks.....	151
Privates, first class.....	1,358
Privates.....	1,345
Total.....	3,461

Total number of losses during year, 1,706; gain, 1,636.

In order to fill the vacancies existing in the grade of sergeant first class and to meet the needs of the service, examinations were held in the United States and in the Philippines Division in November and December, 1908. Of the candidates examined by the different boards 44 received the passing mark, 75 per cent. The result was gratifying in that 4 received over 90 per cent, 25 from 80 to 89, and 15 from 75 to 79 per cent. Forty-one of the successful candidates have been appointed sergeants first class.

All the available candidates for the position of sergeant that were on the eligible list at last report, June 30, 1909, have been appointed. Examinations were held during the fiscal year in the different military departments in the United States and in the Philippines Division, and it is expected that the successful candidates will receive their appointments soon after July 1, 1909, when vacancies for 50 additional sergeants provided for in the army appropriation act for 1909 and 1910 will become available.

The original vacancies for 30 additional corporals, created by aforementioned act, have been allotted to the different military depart-

ments and independent stations and privates recommended for them will be appointed on or soon after the 1st of July, 1909. From recommendations received, it is evident that medical officers appreciate the opportunity of being able to recommend men of long and faithful service and zealous attention to duty for promotion to the grade of corporal. Naturally many of the valuable men have not the technical knowledge which is required for the higher grades of noncommissioned officer.

In the early part of November, 1908, Company A, Hospital Corps, was transferred by direction of the Secretary of War from Camp Columbia, Cuba, to Fort D. A. Russell, Wyo., where quarters for a hospital corps company had been available for some time.

During the entire fiscal year Company B, Hospital Corps, has been stationed at the United States Army General Hospital, San Francisco, Cal.

Upon the return of the engineer troops from Cuba to Washington Barracks, D. C., it became imperative to find other quarters for Company C, Hospital Corps, and it was temporarily sent into camp at the Walter Reed United States Army General Hospital, Takoma Substation, Washington, D. C., where it remained until June 2, 1909, when it left for Fort Niagara, N. Y., for temporary station until quarters could be finished at the Walter Reed United States Army General Hospital. This will hardly be until late in 1909 or early in 1910.

Company D, Hospital Corps, is on duty in the Philippines Division and serves there as a base of supply for hospital corps personnel, as a company of instruction and as a unit for furnishing a complete field hospital outfit for active field service on a few hours' notice.

In fact, with a view to immediate availability for active service, all four hospital corps companies are so organized and administered, except so far as transportation is concerned, that they are able at a moment's notice to take the field fully equipped with a complete field-hospital outfit. As an illustration of the necessity for this preparedness, it may be well to refer back to the services rendered by Company A, Hospital Corps, at San Francisco, Cal., after the earthquake, and by a portion of Company C, Hospital Corps, in the State of Mississippi after the last hurricane. These services, it should be noted, could be efficiently performed without much demand being made for transportation, but it should be fully realized that if companies of instruction are to perform promptly the duties of field hospitals they must have their complete transportation at all times and not be compelled to have it collected from various points at a distance, as is now the case.

During 1908 Company C, Hospital Corps (divided into two sections), took part in the field exercises at Pine Camp, Pine Plains, Jefferson County, N. Y.; at Chickamauga Park, Ga.; Fort Benjamin Harrison, Ind.; Fort Riley, Kans.; and at the national match, Camp Perry, Ohio. One half of Company B, Hospital Corps, with field hospital No. 15, was on duty in July, 1908, at camp at Leon Springs, Tex., and at the camp at Fort D. A. Russell, Wyo. The other half was at American Lake, in the State of Washington, with field hospital No. 1, where it arrived within eighteen hours from the time it left San Francisco and was ready to receive patients. An ambulance section took part in all of these field exercises. The entire company

left San Francisco September 10 and marched to maneuver camp at Atascadero, Cal.—225½ miles—the men marching 24 miles on the last day, arriving at the camp in fine condition, carrying their full field equipment and blanket rolls. During their stay at this camp 120 cases were treated in the field hospital—of the Regular Army, 81; of the militia, 36; and 3 civilians. As a whole, the men performed their duties very well and the discipline was excellent.

Recruiting for the Hospital Corps was satisfactory during the greater part of the fiscal year, but in the last month, June, it became apparent that no more men could be accepted, in order not to exceed the authorized limit of strength—3,500. While the act of Congress approved March 3, 1909, increased the number of noncommissioned officers by 80 (50 sergeants and 30 corporals), thereby establishing a proper ratio—1 noncommissioned officer to 4 privates or 700 noncommissioned officers to 2,800 privates—for the corps, this naturally was at the expense of the number of privates, as the 80 for noncommissioned officers came from the 2,880 privates heretofore allowed. It may be readily seen that such a loss materially affected the working force of military hospitals, and as a consequence a great many applications for additional privates have been received. Under existing conditions, however, the department finds itself unable to furnish these men. It was probably assumed that the abandonment of some of the smaller posts and the consolidation of troops into larger posts would lessen the demand for privates of the Hospital Corps, but this has not proved to be the case, as the present modern hospital buildings with their numerous isolation wards, operating rooms, electrical appliances, and steam or hot water heating apparatus require a much greater number of Hospital Corps men than did the older hospitals, which in most cases were entirely without conveniences which are now considered essential. Moreover, the army as a whole has been notably increased in strength without a proportionate increase in privates, Hospital Corps. This condition has already been brought to the attention of higher authority by this office, but it is understood that it is not practicable to afford relief at the present time. With the same object in view, the estimates for the Hospital Corps for the fiscal year 1910–11 have been increased to include 500 additional privates. It is hoped that as soon as an opportunity affords, this increase may be obtained. Maintaining the same proportionate number of hospital privates previously allowed to the strength of the army will only give the sick and wounded the care and attention to which they are accustomed and to which it is believed they are justly entitled.

It will be noted that transfers from the Hospital Corps to the line number 67 this year as compared with 36 last year. In short, nearly twice as many men have been transferred from the Hospital Corps to the line. This question was discussed at some length in last year's report, and these figures establish the fact that with the increased inducements presented by the line, transfers from the Hospital Corps to the line are likely to increase. It may be that this is not a suitable time to urge an increase in pay for the Hospital Corps, but in all justice to that corps attention must be invited to the fact that in the bill increasing the pay of the army its increase was an inadequate one, besides being very small as compared with the line of the army. As noted above, this has not yet seriously affected the Hospital Corps

so far as quantity is concerned, but it is believed that this is not so true in reference to quality. Certainly the men transferred have been a distinct loss on account of their generally high character and attainments.

Private First Class James Brody, Hospital Corps, was highly commended in a communication of September 27, 1908, by the officers and passengers of the steamship *Northwestern*, on her trip from Seattle to Nome, for his "prompt, gratuitous, continuous, and efficient service rendered the sick passengers"—no doctor being then aboard that vessel.

THE NURSE CORPS.

During the present year 501 nurses applied for admission to the Army Nurse Corps. There were 25 discharges and 36 appointments, one of the latter having had previous service in the army. One death occurred. On June 30, 1909, there were 91 nurses in the corps, distributed as follows:

General Hospital, San Francisco, Cal.....	39
General Hospital, Fort Bayard, N. Mex.....	19
	<hr/> 58
Philippines Division:	
Division Hospital, Manila.....	18
Iloilo.....	2
Zamboanga.....	5
Camp Keithley.....	2
Fort William McKinley.....	4
En route from United States.....	2
	<hr/> 33

Comparison with conditions at the end of the last fiscal year shows an increase of 112 applications and of 10 appointments during the year at present under discussion. But 6 names now appear on the eligible list.

Little can be added to the rather exhaustive statement made on the subject of the Army Nurse Corps in last year's report. Though there has been a slight increase in numbers, it is no less evident, as stated last year, that the rewards in the Army Nurse Corps must be increased if a sufficient number of desirable candidates are to be obtained. Nothing has been done in this direction during the year, except that laundry has been provided for the uniforms of nurses worn in the hospital wards. In fact, this is all that can be done under the present law, except that a probationary school might be established. An appropriation has been asked for the construction of quarters for nurses at the Walter Reed General Hospital. Giving nurses on appointment a short service here (with discharge if such service was not satisfactory), under the direct observation and supervision of the superintendent, would, perhaps, do more to increase the efficiency of the Army Nurse Corps than anything permissible under the present law. This would also effect a considerable saving to the Government, as it would prevent the furnishing of expensive transportation until after a nurse had shown conclusively that she was fitted for the military service. The recommendations of last year are equally pertinent at present. Those which have not been already discussed are as follows:

1. The per diem allowance of 30 cents for the subsistence of nurses be increased to 50 cents.
2. Recognition of long and faithful service by an increase in the pay of nurses of 10 per cent for every five years of service, the maximum to be reached in fifteen years; this provision to be retroactive.
3. Cumulative leave for a period not to exceed three months.

ARMY MEDICAL SCHOOL.

The thirteenth session began October 1, 1908, and closed May 29, 1909.

The number of accepted candidates, appointed first lieutenants in the Medical Reserve Corps and admitted to the school, was 33, and of medical officers of the militia, 1.

This large increase in the number of student candidates over that of former years shows the immediate effect of the much brighter prospects now opened out in the army to young graduates from our best medical schools by the "act to increase the efficiency of the Medical Department of the United States Army," approved April 23, 1908.

It is to be regretted that so few medical officers of the militia are able to avail themselves of the benefit of the school. The conditions of admission (under provisions of G. O., No. 139, 1905, and G. O., No. 134, 1907) have been made as easy as possible, and their failure to present themselves depends upon causes for which no remedy can be suggested.

The 33 candidates completed the course; 29 passed their final examination successfully and were awarded certificates of proficiency; 4 failed to pass the examination. The medical officer of the militia completed the course but did not pass the examination.

The following table shows the subjects taught, the hours of instruction in each subject, and the names of the instructors:

No.	Hours.	Subject.	Instructor.	Maximum.	Minimum.
1	112	Duties of medical officers, medical department administration and customs of the service.	Lieut. Col. Wm. H. Arthur, and Capt. Chas. R. Reynolds.	1,000	800
2	280	Clinical microscopy and bacteriology.....	Maj. F. F. Russell.....	900	720
3	25	Military hygiene.....	Col. V. Havard.....	800	640
4	22	Military surgery.....	Maj. F. A. Winter.....	800	640
5	24	Military and tropical medicine.....	Lieut. Col. W. D. McCaw....	800	640
6	170	Sanitary chemistry.....	Maj. C. R. Darnall.....	600	480
7	58	Hospital corps drill and field work.....	Capt. Chas. R. Reynolds....	500	400
8	24	Operative surgery.....	Capt. H. F. Pipes.....	400	320
9	52	Ophthalmology and optometry.....	Lieut. Col. W. D. Crosby....	400	320
10	10	Roentgen-ray work.....	Capt. H. F. Pipes.....	300	240

In addition to the above the following instruction was also given: Twenty hours in equitation at Fort Myer, Va., by Second Lieut. Richard D. Newmann, Thirteenth Cavalry, and Capt. Frederick B. Hennessy, Third Field Artillery.

A series of 7 lectures on military law by Gen. Geo. B. Davis, Judge Advocate General, U. S. Army, and Maj. John B. Porter, Judge Advocate General's Department.

A series of 6 lectures on insanity at the Government Hospital for the Insane, by Dr. Wm. A. White.

A series of lectures and demonstrations on mosquitoes by Dr. C. S. Ludlow.

A lecture on "Map reading" at the Army War College, by Capt. R. H. Van Deman, General Staff.

The class also attended a series of surgical clinics at the United States Army General Hospital, by Lieut. Col. Wm. H. Arthur.

The final examination began May 7 and ended May 14, 1909.

Four of the student candidates have obtained a general average of more than 90 per cent of all possible marks, and are borne on the roll as "proficient with honor."

The Hoff memorial medal for the highest standing in the class was awarded to Lieut. Henry C. Coburn, jr., Medical Reserve Corps.

The conduct and deportment of the members of the class were at all times excellent.

The supplementary clinical examination was held from May 17 to May 22, and was successfully passed by the 29 graduates. Having also been found to possess satisfactory aptitude for the military service, they were all accordingly recommended for appointment in the Medical Corps.

The closing exercises took place in the Continental Hall of the Daughters of the American Revolution on May 29, the address to the graduates being delivered by Dr. Roswell Park, of Buffalo, the diplomas awarded by the honorable the Secretary of War, and the Hoff memorial medal by Gen. J. Franklin Bell, Chief of Staff.

Relative proficiency of the graduates of the Army Medical School, session 1908-9.

First Lieutenants, Medical Reserve Corps.	Aggregate (maximum 7,000, minimum 5,600).	Remarks.
Rozler C. Bayly.....	5,667	Honor graduate and medalist.
Daniel P. Card.....	6,252	
Henry C. Coburn, jr.....	6,414	Honor graduate.
Addison D. Davis.....	5,762	
William R. Dear.....	6,304	
Charles E. Doerr.....	6,176	
Lee R. Dunbar.....	5,979	
Clarence E. Fronk.....	5,650	
Leon C. Garcia.....	5,787	
Ralph D. Goldthwaite.....	6,256	
Daniel W. Harmon.....	6,231	
George D. Heath, jr.....	5,731	
Eben C. Hill.....	6,118	
Robert W. Kerr.....	5,799	
Thomas J. Leary.....	6,045	
Norman L. McDiarmaid.....	6,271	
George H. McLellan.....	6,079	Honor graduate.
James C. Magee.....	6,102	
Armin Mueller.....	6,114	
Alexander D. Parce.....	6,007	
William S. Shields.....	6,116	
William H. Smith.....	5,759	
Corydon G. Snow.....	6,308	
Morrison C. Stayer.....	6,023	
Clarence A. Tretholtz.....	6,214	
Arnold D. Tuttle.....	6,411	Honor graduate.
John B. H. Waring.....	6,064	
James A. Wilson.....	6,032	
Frederick S. Wright.....	6,059	

Maj. John T. O'Ferrall, surgeon, Mississippi National Guard, also attended this session of the school.

SPECIAL SANITARY WORK OF MEDICAL OFFICERS.

During the year 1908 medical officers of the army have been in charge of sanitary matters connected with two great enterprises in which the Government is engaged and which are administered through the War Department, namely, the construction of the Panama Canal and the government of intervention in Cuba. Col. William C. Gorgas, who has been chief sanitary officer of Panama since 1904, is assisted by five other medical officers of the army—Lieut. Col. John L. Phillips, Maj. Charles F. Mason, Maj. Theodore C. Lyster, Capt. Robert E. Noble, and Capt. George H. Crabtree. The sanitary work on the Isthmus is most creditable to the nation as well as to those engaged in it. The death rate among the population of the Canal Zone has diminished 50 per cent in three years and now is less than that of many of the cities in the Gulf States. The death rate for disease among white American employees, 3.84, approximates that of the army. It has been more than three years since a case of yellow fever or plague developed on the Isthmus.

Sanitary affairs in Cuba have been during the period of intervention under the administrative control of Maj. J. R. Kean, Medical Corps, assisted by four medical officers detailed from the army of Cuban pacification, viz, Maj. P. C. Fauntleroy, Maj. J. R. Church, and Capts. John H. Allen and Henry D. Thomason. Capt. J. L. Bevans was also assigned to duty with the provisional government in connection with the administration of hospitals and charitable institutions. The intervention in September, 1906, found the sanitary administration of the Cuban cities outside of Havana in a state of great neglect, due to lack of funds and of proper organization and methods. Yellow fever had also been reintroduced into the island and had spread widely into the small towns and sugar centrals of the interior, differing in this respect from its former habit of clinging to the larger seaport towns. This change of behavior was due to the great increase in the number of nonimmunes among the country population and to the increased facilities for travel. The methods of combating the disease formerly devised by Gorgas for Havana were extended to other foci of infection and modified to suit changed conditions. Political conditions required the distribution of the American troops in the various cities, where they were much exposed to this infection; yet so perfect was the cooperation between the medical service of the army and the sanitary authorities that outbreaks of yellow fever among our soldiers have been few and promptly checked. Since February 18, 1908, there has been no case of yellow fever in the whole island west of Santiago, except one mysterious case in Havana in September, and the outbreak in the extreme eastern end of the island was easily controlled. Yet the freedom of all Cuba except the most eastern of the six provinces from the disease throughout the summer did not save the island from a blanket quarantine by the United States, and this in spite of an international sanitary treaty to which both nations are parties, which provides among other things for the localization of quarantines.

The termination of the provisional government on January 28, 1909, left the island entirely free from yellow fever, and it has so remained. The sanitary department was also completely reorganized,

and the quarantine service and department of charities consolidated with it into a department of health and charities, at the head of which is a secretary, who is a member of the cabinet. The sanitary service of all municipalities was nationalized by being placed in charge of sanitary officers appointed by the President. The expenses of the municipal sanitary services are paid from the national treasury, and each municipality, in consideration thereof, pays into the treasury one-tenth of its income. Uniformity of method of administration and adequate financial support being secured by the admirable sanitary law promulgated by the provisional governor, the Republic of Cuba has in sanitary administration advanced to the front rank among the nations.

Among the professional activities of medical officers which will contribute materially toward the diffusion of sanitary knowledge in the army should be mentioned two excellent works on military hygiene, which have been written during the year. A Manual of Military Hygiene, by Col. Valery Havard, president of the Army Medical School, applies in a practical manner for military use the latest advances in preventive medicine and the results of the author's wide experience during thirty-eight years of service. The Elements of Military Hygiene, by Maj. Percy M. Ashburn, a small treatise, written in an attractive style for nonprofessional readers, will be a valuable addition to the working library of line officers.

Capt. Charles F. Craig has written an elaborate work upon the malarial fevers, embodying much original work, and brings the literature in English of this important disease up to date.

Maj. Charles Lynch has written for the use of the American Red Cross a text-book on first-aid and relief columns. Maj. Charles F. Mason has published a second and enlarged edition of his Handbook for the Hospital Corps, which is used as a text-book for the instruction of the enlisted men of the Hospital Corps in the United States Army and the organized militia.

During the year the Post Graduate School and Hospital, New York City, extended the privileges of the school to all medical officers of the army, and by mutual agreement at the same time a medical officer, in addition to other duty, was assigned to the school as instructor in tropical medicine. This arrangement has proved of great mutual benefit.

The department is also much indebted to Dr. W. M. Park, director of the research laboratory of the New York department of health, for courtesies extended to army medical officers at that laboratory.

UNITED STATES ARMY GENERAL HOSPITALS.

SAN FRANCISCO, CAL.

This hospital is used as a base hospital for the Philippines and Hawaii and is the largest of the army general hospitals, excluding the hospital for tuberculosis at Ford Bayard.

The number of cases treated during the year was 2,293, being an increase of 377 over the preceding year. The daily average of patients for the year was 244. There were 48 deaths during the year; the largest number from any one disease being 6 from pneumonia. There were 167 discharges on surgeon's certificate of disability. The

largest number from any one cause was 10 for flat foot. Next came 6 each for syphilis and gonorrhea, including gonorrheal rheumatism.

The mean strength of the personnel on duty at this hospital for the year was 8 officers and 169 enlisted men of the Hospital Corps. Company B, Hospital Corps, was also stationed at this hospital with a mean strength of 2 officers and 111 enlisted men.

FORT BAYARD, N. MEX.

This hospital, which is intended for the treatment of cases of pulmonary tuberculosis in the army, was commanded during the year by Lieut. Col. George E. Bushnell, Medical Corps.

A new administration building is in process of erection. This will provide accommodations for the offices of the commanding officer, adjutant, and quartermaster, as well as for the telephone and telegraph offices and the post-office. An appropriation has been made by Congress for seven double sets and one single set of officer's quarters and for quarters for the nurses belonging to the Army Nurse Corps, but work upon these buildings has not yet commenced. A new storehouse for medical property has also been authorized.

The number of tuberculous cases under treatment December 31, 1907, was 255; on December 31, 1908, 288. The total number of cases of tuberculosis treated during the year was 623, of which 618 were cases of pulmonary tuberculous. Nine other cases were sent to this hospital with the diagnosis of tuberculosis which were found to be nontuberculous. Of these, 2 had syphilis, 1 aneurism of the aorta, 1 abscess of the liver, 1 neurasthenia, 1 lymphatic leukæmia, 1 pernicious anæmia, 1 fibrinous bronchitis, and 1 mitral stenosis. In addition 2 nontuberculous cases with pulmonary involvement were admitted for treatment and were discharged apparently cured, one being a case of pulmonary oidiomycosis, the other a case of subphrenic abscess secondary to suppurative appendicitis.

The results in the treatment of pulmonary tuberculosis are given in the following table, which comprises all cases of this disease which were under treatment in 1908:

Class.	Num-ber.	Apparently cured.		Arrested.		Improved.		Unimproved.		Died.	
		Num-ber.	Per cent.	Num-ber.	Per cent.	Num-ber.	Per cent.	Num-ber.	Per cent.	Num-ber.	Per cent.
Incipient.....	85	14	16.47	23	27.06	29	34.12	17	20.00	2	2.35
Moderately advanced.....	338	17	5.03	61	18.05	148	43.79	99	29.29	13	3.84
Far advanced.....	192			8	4.16	60	31.25	84	43.75	40	20.84
Acute miliary.....	3									3	100.00
Total.....	618	31	5.01	92	14.89	237	38.35	200	32.36	58	9.39

This table includes 23 cases that were under observation less than two weeks in which no result was recorded and which consequently were marked unimproved. One case "apparently cured" and 1 case "arrested" on admission are also included. Of the 58 deaths, 4 were not due to tuberculosis; 1 death occurred from appendicitis, 2 from abscess of liver, and 1 occurred outside of the hospital from acute alcoholism.

The following table shows the results obtained in the treatment of cases of pulmonary tuberculosis under observation for six months or more:

Class.	Num- ber.	Apparently cured.		Arrested.		Improved.		Unimproved.		Died.	
		Num- ber.	Per cent.	Num- ber.	Per cent.	Num- ber.	Per cent.	Num- ber.	Per cent.	Num- ber.	Per cent.
Incipient.....	68	13	19.12	20	29.41	25	36.76	10	14.70	.....	.....
Moderately advanced.....	170	11	6.47	48	28.23	72	42.35	37	21.77	2	1.18
Far advanced.....	75	.....	.....	8	10.67	18	24.00	41	54.66	8	10.67
Total.....	313	24	7.67	76	24.28	115	36.74	88	28.11	10	3.20

Sixty deaths occurred during the year, of which 58 were due to tuberculosis, or occurred in tuberculous subjects, and 2 resulted from other diseases, 1 being due to mitral stenosis and 1 to lymphatic leukæmia.

The following table shows the duration of treatment at this hospital of all tuberculous cases which terminated fatally during the year, including 1 patient who died outside of the hospital:

	Weeks.				Months.			Years.			Total.
	1.	2.	3.	4.	2.	3-6.	7-12.	2.	3.	4. ^a	
Time of death of 37 cases under continuous treatment.....	1	5	1	4	7	10	8	1	.....	.....	37
Time of death of 21 cases not under continuous treatment:											
(a) Reckoned from last admission.....	7	.....	.....	5	2	4	3	.....	.....	.....	21
(b) Reckoned from original admission.....	.....	.....	.....	.....	.....	.....	3	7	5	6	
Total.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	58

^a Four years or more.

WASHINGTON, D. C.

During the calendar year 1908 this hospital continued to occupy the old and inadequate buildings constituting the post hospital at Washington Barracks while awaiting the completion of the new hospital on land purchased on Brightwood (now Georgia) avenue, in the northern part of the city. This hospital served as a post hospital for Washington Barracks during the year. The total number of cases admitted were 760, of which 393 were medical, 285 surgical, and 109 venereal. The number of officers on the active list admitted to the hospital was 47, of which 9 remained on treatment at the end of the year. Ten retired officers were also admitted and 22 retired soldiers. Ten civilians were also admitted during the year. There were 22 discharges on surgeon's certificate of disability during the year and 16 deaths. Sixty-eight major operations were performed during the year and 55 minor operations. Among the major operations were appendectomy, 10; appendicostomy, 2; amputation, middle third, right leg, 1; cholecystostomy, 1; herniotomy, 20; laparotomy, 4; nephrectomy, 1.

General Orders, No. 70, War Department, April 14, 1909, ordered the discontinuance of this hospital as a general hospital and the opening of the new hospital under the name of the Walter Reed United States Army General Hospital. It was afterwards designated to serve as the post hospital for Washington Barracks, patients requiring bed treatment being authorized to be transferred to it without authorization from higher authority. They are transported by a steam automobile ambulance, and this arrangement is believed to have given a satisfactory hospital service. The new hospital is a handsome and commodious structure, and both well planned and well constructed. It will accommodate 80 patients. Limited accommodations are provided for the care of women connected with the army requiring hospital treatment or surgical operation. There is at present no accommodation for female nurses, but an estimate for a building for this purpose has been approved by the Secretary of War. All of the necessary auxiliary buildings have not yet been provided, but a hospital corps barrack, two sets of officers' quarters, a stable, and storehouse are now under construction. The construction of quarters for the commanding officer and other officers connected with this institution are very necessary, and estimates therefor will be approved by higher authority. It is also desirable to secure additional ground, about 18 acres, so as to make the plot owned by the Government an approximate rectangle instead of an irregular rhomboid, as at present. This will give the hospital an opening on the Fourteenth street extension, and would secure the best and highest ground in the city, besides making it possible to avoid the crowding of the buildings in the northeast corner of the plot. It would also make it possible to keep out of sight from the main street the necessary administrative buildings, such as stables, storehouses, power house, etc., and would allow space for a hospital garden, dairy, and laundry. It is interesting to note in connection with the completion of this hospital that the construction of a general hospital at Washington was recommended by Surgeon-General Hammond in 1862.

ARMY AND NAVY GENERAL HOSPITAL, HOT SPRINGS, ARK.

This hospital is intended especially for patients having diseases in which hydrotherapeutic treatment is indicated.

The movement of the sick during the year 1908 at this hospital is shown in the following table, which includes retired and discharged soldiers of the Army and Navy, both Regular and Volunteer, as well as those on the active list:

Remaining December 31, 1907.....	87
Admitted.....	743
Discharged from hospital (duty).....	689
Discharged from service for disability.....	14
Died.....	8
Transferred to other hospitals.....	7
Otherwise disposed of.....	2
Aggregate treated in hospital.....	830
Remaining December 31, 1908.....	99

Included in the above statement are 30 officers of the army and 2 of the navy on the active list, and 14 retired officers, including 1 from the navy.

The causes of admission were in general:

Epidemic diseases.....	4
General diseases.....	227
Diseases of the—	
Nervous system.....	138
Eye.....	1
Circulatory system.....	24
Respiratory system.....	8
Digestive system.....	86
Genito-urinary system.....	75
Skin and cellular tissue.....	45
Organs of locomotion.....	197
Other diseases.....	14
Injuries.....	11
Total.....	830

Among the general diseases are included 186 cases of acute and chronic rheumatism.

This hospital has during the year been commanded by Maj. George D. Deshon, Medical Corps.

The present facilities of this hospital for the treatment of officers and men on the active list of the army and navy are ample, and no increase in accommodations on their account is needed, except that one double set of lieutenant's quarters of the latest pattern should be provided for the junior medical officers on duty here. This requirement is imperative and immediate, being in the interest of economy, good service, and good discipline.

The number of ex-soldiers and ex-sailors who come here for treatment during the winter has grown to such an extent as to make it necessary either to formulate some means of curtailment or to enlarge the capacity of the hospital.

In 1901 veteran patients were first admitted. The following table shows the daily average of such patients since that date during the months of March and August, these months being selected because in March the season here is at its height and the number of patients in this hospital is at the maximum, while in August the heat is the most intense and the number of patients is at the minimum.

Daily average of patients (veterans) in hospital.

	1901.	1902.	1903.	1904.	1905.	1906.	1907.	1908. ^a
March.....	21	24	34	47	40	46	43	73
August.....	7	19	22	27	37	25	32	45

^a To date.

From this it will be seen that there is a steadily increasing demand for admission from this class of patients, that during the crowded portion of the past season their number was 60 per cent higher than the previous maximum, and that during the present month when the number of patients is at the lowest ebb of the year their number is 16 per cent higher than the previous low-month maximum.

Until recently this institution has been little known among veterans, but this condition is rapidly changing. Each old soldier returning from here to his home becomes a center of dissemination of information concerning Hot Springs and the facilities for treatment offered by the Government to ex-soldiers, and before many months

several other veterans from the same neighborhood apply for admission. They are surprised to find that they can obtain board, lodging, baths, medicines, nursing, and the professional services of medical officers of the army for 40 cents per day. To most of them this is cheaper than staying at home.

The veterans of the civil war are being rapidly overtaken by the infirmities of age, and each year will find a relatively larger proportion of them in need of hospital treatment.

The number of soldiers of the Spanish-American war who come here as patients is also constantly increasing. It seems probable that when the number of civil war patients diminishes it will be fully compensated for by the increased admissions from those who have served in the Spanish-American and later campaigns.

This last winter the hospital was full and overflowing, so that on several occasions veteran patients arriving from the North were obliged to wait several days for vacancies.

The hospital has 122 beds. Of these 14 are in private rooms and intended for sick officers, and 108 are in four wards. One ward is occupied by soldiers now in the service of the United States and the other three wards by veterans.

By the proposed enlargement the War Department would acquire possession of a fully equipped general hospital centrally located (particularly in the event of the Mississippi waterway improvement) and of sufficient size to be of considerable value as a reserve hospital in time of war.

For the reasons above given it is recommended that one new 48-bed, two-story ward be erected at once and that a second story be added to the present north and south wards. This would double the present ward capacity, giving a total of 216 beds in the wards.

Later on additional wards of two stories each could be built as needed.

The present mess hall can be doubled in capacity by installing dumb waiters and utilizing as an additional dining room the second story, which is now occupied as a dormitory for the hospital corps. This would necessitate building a barrack for the hospital corps sufficiently large for one company with its own separate mess. At present the hospital corps eat with the patients. Advantage to all concerned would result from separation. The proposed plan would also permit the serving of full-diet patients in one room and diabetics, Bright's cases, and special diets in another room.

The bath house should be extended at both ends so as to double its present capacity.

The power house should be extended to the north sufficiently to furnish the additional heat, light, and power needed for a greater plant.

A gymnasium should be built with specially devised apparatus for the mechanical treatment of ankyloses, adhesions, and deposits.

Any extensive enlargement of the hospital would necessitate occupying all of the administration building for administrative purposes. This would make it necessary to find other accommodations for the officer patients who are now quartered in private rooms in that building. For this purpose a building should be erected large enough to contain a 24-bed ward, 6 private rooms, a reading room, a dining room, kitchen, servants' rooms, and a bath equipped with all special apparatus needed in hydrotherapy.

The commanding officer states that a comfortably furnished private room with heat, light, and good attendance, all free and located at a popular winter resort, is very prone to cause officer patients to magnify trivial ailments and seek to prolong their stay unnecessarily and unreasonably. This evil would be minimized by placing officer patients in a ward where they could be kept under more perfect observation and control.

All young officers should be placed in the ward. A few private rooms should be provided for serious cases and for older officers of high rank. The advantages of a mess for sick officers are too obvious to need explanation. At present officers who are too sick to be out are served their meals in their rooms. All others obtain their food outside the hospital wherever fancy leads them, which is sometimes disastrous.

A second observation alluded to above is the large number of cases of syphilis in its secondary and tertiary manifestations which come here under faulty diagnosis and which after a few weeks' treatment with massive doses of iodide of potash and mercurial inunctions are returned to their stations fit for duty and apparently cured. In view of this seeming not uncommon inability of medical officers to recognize and properly treat these cases, the thought occurs that it might be well to relax somewhat the present regulations which prohibit such cases from entering the hospital. Properly selected cases might be authorized to come here at their own expense. Were this done it would result in doubling the number of soldier patients now here and necessitate a separate venereal ward for their accommodation and isolation.

The estimated cost of the proposed construction is about \$400,000. There is sufficient ground belonging to this hospital so that the above buildings can be conveniently arranged and yet sufficiently separated to avoid danger in case of fire, but this ground is very irregular and the cost of cutting and filling would be considerable.

The land lying to the north of the hospital, and now the property of the Interior Department, is level and if it could be obtained would reduce the cost of building.

PROVIDENCE HOSPITAL.

The act approved May 27, 1908, having appropriated \$19,000 for the support and medical treatment of destitute patients in the city of Washington, D. C., under a contract to be made with Providence Hospital by the Surgeon-General of the Army, the relief afforded was as follows:

Patients in hospital July 1, 1908.....	97
Admitted during the year.....	1,227
Total number treated.....	1,324
Average number admitted per month.....	110
Number remaining in hospital June 30, 1909.....	105
Total number of days' treatment afforded.....	36,727
Average number of days' treatment per patient.....	28
Average number of patients treated per day.....	100
Longest term treatment (days).....	279
Shortest term treatment (days).....	1
Number of patients in hospital during the whole year.....	None.

CONSTRUCTION AND REPAIR OF HOSPITALS.

During the past fiscal year plans and specifications were prepared in this office for new hospitals to be erected at Boise Barracks, Idaho, and Fort Crockett, Tex.; also for isolation hospitals to be erected at Fort Leavenworth, Kans., Fort Riley, Kans., and Fort Slocum, N. Y. Plans and specifications were also prepared for enlarging the hospitals at Fort Brady, Mich., Fort Crook, Nebr., Fort D. A. Russell, Wyo., Jefferson Barracks, Mo., Fort Leavenworth, Kans., Fort Logan, Colo., Fort Omaha, Nebr., Fort Robinson, Nebr., Fort Sam Houston, Tex., Fort Sheridan, Ill., Fort Slocum, N. Y., Fort Snelling, Minn., Fort Williams, Me., and Fort Worden, Wash.; also for improvements required for the hospital at Columbus Barracks, Ohio, and for the Walter Reed Army General Hospital, District of Columbia. Sketch plans were also prepared for a pavilion ward, to be constructed of concrete, for insane patients at the United States Army General Hospital, San Francisco, Cal., and for enlarging the hospital at Fort Shafter, Hawaii.

Contracts were entered into for the erection of the new hospitals, including the isolation hospitals, also for some of the additions and improvements, including a storehouse, for the United States Army General Hospital, Fort Bayard, N. Mex. Some of these additions and improvements have been completed, others are in course of erection, and some are in the market for proposals, as they pertain to the appropriation for the next fiscal year. The entire work is progressing in a satisfactory manner, and it is believed that the whole will be under contract in the near future.

Under a special appropriation, buildings are being erected at the United States Army General Hospital, Fort Bayard, N. Mex., consisting of quarters for 20 army nurses, a laundry building, and three double sets of quarters for officers. The construction of other buildings is also contemplated for this general hospital, the cost of which is to be paid from the same special appropriation.

At the Walter Reed Army General Hospital, District of Columbia, the following buildings are in course of erection: One hospital corps barrack building, two single sets of officers' quarters, a storehouse, a stable and wagon shed, also a shed and garage, all of which are being paid for from appropriations made for the Quartermaster's Department. This general hospital was occupied April 30, 1909, and the old hospital at Washington Barracks was turned over to the post authorities, but it is unsuitable for the needs of the garrison at that post and will have to be removed before the barrack building, which is partly erected, can be completed. A new hospital is not needed, as the sick of the command requiring hospital treatment are cared for at the Walter Reed General Hospital, but a small building for dispensary purposes is necessary.

A special appropriation of \$60,000 was made by Congress to erect a new and modern hospital at San Juan, Porto Rico, and was reappropriated for use during the fiscal year, but was not needed, as the War Department, in an exchange of property with the insular government, secured a building which has been used as a military hospital for more than one hundred years. This hospital is a massive rubble structure of brick, stone, and mortar, occupying the western half of the block which faces the infantry barracks, and with an expenditure of about \$10,000 it can be placed in first-class condition.

An allotment of \$50,000 was made from the appropriation for construction and repair of hospitals for use in the Philippines Division during the fiscal year, and an allotment of \$12,000 was also made from the appropriation for quarters for hospital stewards to cover the cost of quarters for hospital corps sergeants, first class, in the same division. So far as known at this time, these allotments were ample for the purposes.

In addition to the foregoing, the hospitals at military posts already established and occupied were improved or kept in proper repair, so far as funds would permit. The Army and Navy General Hospital, Hot Springs, Ark., was also provided for, but this hospital needs additional buildings and ground to meet the increased demands being made for accommodations. The following improvements are considered necessary for this general hospital:

One officers' ward building, one officers' bath house, one officers' mess hall, one double set of officers' quarters, one two-story veterans' ward, one additional story on each of wards Nos. 4 and 5, one medical and physical gymnasium, one hospital corps barrack building, one double set of hospital corps sergeants' quarters, an addition to the power house; also roads, walks, and grading, together with the necessary plans, surveys, etc. These improvements are estimated to cost \$350,000, and effort is being made to secure additional ground from the Department of the Interior.

In connection with an estimate submitted for new plumbing fixtures desired for the Army and Navy General Hospital, to replace unserviceable fixtures which became clogged by a deposit from the water, it was found by an analysis made in this office that the deposit was soluble in a solution of muriatic acid, and a practical test developed the fact that porcelain plumbing fixtures immersed in a 20 per cent solution of the above-named acid for forty-eight hours cleansed them entirely, while lead and iron pipes, similarly clogged, immersed in the same solution for twelve hours were thoroughly freed from the deposit without apparent injury.

Numerous military posts require new hospital buildings to replace old and dilapidated structures which have been in use for many years, and which require large sums of money annually for repairs or improvements. New structures of a modern type would be economical, but it is not possible to erect a suitable modern hospital at any military post for the maximum sum allowed by law for such purpose. Section No. 1136, Revised Statutes of the United States, limits the cost of permanent structures to \$20,000, unless special authority be first obtained from Congress. This law was enacted in 1853, when material and labor were much lower in price than they are at present, and it is thought that this statute should be modified to suit the changed conditions.

New and improved hospitals should be erected at the following military posts in the near future:

Fort McPherson, Ga.—The hospital at this post is entirely inadequate, is located in close proximity to a railroad, has no cellar, except a small excavation for a heating apparatus which was made some years after the building was erected. The heating and ventilation are not suitable for a modern hospital. The plumbing is crude, and effort has been made from time to time to improve it, but it is far from being in compliance with modern sanitary requirements.

The operating room is located in a small annex and adjoins a small laboratory. There is no instrument room, no etherizing room, no preparation or recovery rooms, and no surgical ward. There is no suitable ward for the isolation of contagious diseases, and no prison ward, and the hospital corps detachment is quartered in an old temporary wooden building which was erected for use during the Spanish-American war. The mess room and kitchen are too small, and are unsuited for their purposes, it being necessary to set tables two or three times to accommodate the inmates, and the entire hospital is such that it would be in the interest of economy to replace it with a modern structure. A hospital of sufficient capacity should contain 87 beds for patients and attendants, and the estimated cost of such a building is \$90,000.

Fort Missoula, Mont.—This post has a provisional hospital of wood and it was erected in 1878. It is entirely devoid of modern appliances, and it would be a waste of funds to undertake to improve it. A regimental post is in course of erection at this fort, and a new modern hospital of sufficient capacity is a necessity which should be supplied. A suitable hospital should have accommodations for 60 patients, 22 hospital corps privates, and 5 noncommissioned officers, and the estimated cost of such a building is \$90,000.

Post of Washington Barracks, District of Columbia.—This is an engineer post in connection with the Army War College. A small hospital was erected at this station in 1893, became a general hospital in 1898, was abandoned as such on completion of the Walter Reed Army General Hospital in 1909, and is to be torn down for the purpose of securing room to complete a barrack building which is partly erected. Some provision should be made for sick call, administration purposes, and for the temporary care of the sick at this post, and it is believed that a central infirmary with one small ward, a receiving room, office, etc., to care for the sick until such time as the patients can be moved to the Walter Reed Army General Hospital will answer the purpose. A suitable infirmary building, in keeping with the other buildings at the post, is estimated to cost \$25,000.

Fort Logan H. Roots, Ark.—The hospital at this post is inadequate and obsolete. It has no cellar and was originally heated by stoves, but a small cellar was constructed under an outbuilding for a heating plant. This is unsatisfactory on account of the distance of the boilers from the building, which necessitated the laying of pipes under the porches and open foundations, causing the loss of a large amount of heat, and it is almost impossible to secure a comfortable temperature in the hospital during even moderately cold weather. Plans and specifications were prepared in this office for a small addition to this hospital with the view of better adapting it for use, but the lowest bid received was over \$38,000. Owing to the fact that the building is far from being modern or suitable; that the heating and ventilation are unsatisfactory; that there is no cellar; no modern operating room; that the addition, even if authorized, would not modernize it; and that the hospital would continue to be a source of complaint and expense, it was decided to recommend the rejection of all proposals, to recall the plans and specifications, and to ask for sufficient funds to erect a modern hospital of suitable capacity. The hospital at this post should have accommodations for 18 patients, 8 hospital

corps privates, and 2 noncommissioned officers. The high cost of material, labor, and transportation at this post renders building expensive, and it is estimated that \$50,000 will be required to erect a modern hospital on the high bluff where this post is located.

Fort Hamilton, N. Y.—In 1904 the commanding officer at this post stated that the present post hospital does not begin to be adequate for the needs of the garrison, that there is insufficient space for attendants, that there is no isolation ward, and no prison ward, and that in the rearrangement of the post a better site has been selected. In 1906 the chief surgeon, Department of the East, stated that the hospital at Fort Hamilton is very badly located, standing on rather low ground, and facing, at a distance of 14 yards, a noisy public highway, on the other side of which are saloons and other objectionable places of public resort. In view of these circumstances it is believed that the interests of the service will be best subserved by erecting a modern hospital on a more appropriate site, especially so as it is proposed to use the present building for a band barrack. A hospital of sufficient capacity for this post should contain accommodations for 40 patients, 16 hospital corps privates, and 4 noncommissioned officers, and the estimated cost of such a building is \$60,000.

Fort Benjamin Harrison, Ind.—One ward wing and the administration building of a modern hospital have been erected at this post, but the building has not been completed. It lacks one ward wing and a rear annex. It is insufficient in capacity, and in March, 1909, the surgeon recommended that the hospital accommodations at this post be doubled. The chief surgeon, Department of the Lakes, stated it is important that the hospital at Fort Benjamin Harrison be completed at an early date, as the hospital facilities are inadequate even for the regular garrison, and are entirely so under present circumstances or when this post is used as a base for the maneuver camp. One wing and the annex of the standard plan are yet lacking—in a word, less than half the hospital has been completed. The department commander stated that this hospital should be completed by adding the other wing and rear annex required for the standard plan for a 60-bed hospital. To complete this hospital by adding the other ward wing and rear annex is estimated to cost \$40,000.

Fort H. G. Wright, N. Y.—This post is being enlarged by the erection of new batteries, new buildings, etc., and the ultimate strength of the garrison is to be seven companies of coast artillery. The present hospital building is in close proximity to the batteries, and is unsuitable for occupation as a hospital. It is also entirely inadequate, but it is proposed to use the building as a band barrack, and to erect a new modern hospital of sufficient capacity on a suitable site removed from interference by gun fire. The enlarged garrison will require hospital accommodations for 40 patients, 16 hospital corps privates, and 4 noncommissioned officers, and the estimated cost of such a building is \$60,000.

Fort Niagara, N. Y.—The hospital at this post has 13 beds, and the garrison is to consist of 8 companies of infantry. This will require hospital accommodations for 32 patients, 15 hospital corps privates, and 4 noncommissioned officers. It is proposed to enlarge this hospital by adding another ward for 12 beds and a rear annex

to contain kitchen, mess hall, hospital corps dormitory, prison ward, isolation ward, etc., and the estimated cost of these improvements is \$35,000.

Fort George Wright, Wash.—The hospital at this post is inadequate, and is not complete. It consists of two ward wings and an administration building, and it is proposed to enlarge the capacity by adding the rear annex which was omitted when the building was erected. This will contain the kitchen, mess hall, hospital corps dormitory, prison ward, isolation ward, etc., and the estimated cost of this improvement is \$25,000.

Owing to the increase in coast artillery and the concentration of companies at various posts, it is necessary to increase the hospital accommodations by enlarging the buildings, and it is estimated that \$100,000 will be required for the purpose.

Isolation hospitals.—Seven of these hospitals have been authorized, one of which has been completed, three are in course of erection, and three remain to be contracted for. Similar hospitals for the treatment of contagious diseases are needed for a number of military posts, and it is believed that at least three of these buildings should be provided in each year until all the regimental and large artillery posts are supplied, as these buildings are absolutely necessary for the treatment of contagious diseases.

In addition to the foregoing, plans and specifications were prepared in this office for hospital corps sergeants' quarters authorized for Columbus Barracks, Ohio; Jefferson Barracks, Mo.; Fort Leavenworth, Kans.; Fort Slocum, N. Y.; and the Walter Reed Army General Hospital, District of Columbia. These are all double sets of quarters, and those at Columbus Barracks, Ohio; Jefferson Barracks, Mo.; and the Walter Reed Army General Hospital have been completed. The others are in course of erection and are nearing completion. A number of large military posts are in need of these double sets of quarters, and the appropriation should be liberal until such time as the hospital corps sergeants are supplied with suitable habitations. All the quarters at military posts already established and occupied have been repaired, improved, and kept in good condition so far as funds would permit.

MEDICAL AND HOSPITAL SUPPLIES.

The amount estimated for appropriation "Medical and Hospital Department" by this office for the fiscal year ending June 30, 1909, was \$700,000. This estimate was approved by the War Department and the amount appropriated by Congress; with this amount it has been possible to meet the demands of the Medical Department in a much better way than has been done since 1906. During the latter part of that fiscal year the fire occurred in San Francisco, which was a great drain on this appropriation, and during the first part of the fiscal year 1907 troops were sent to Cuba, and the equipment of the troops maintained there until April, 1909, was a constant source of expense, and no adequate return was made for these extraordinary expenditures by special appropriation.

Upon the withdrawal of troops from Cuba the early part of this calendar year the regular supplies that had been used on the island were sent to the depot in New York City and the field supplies to the

field supply depot in this city. As usual in such cases, a great quantity of the supplies returned were found unfit for reissue and have been condemned. The estimated extraordinary medical expenses out of the "Medical and Hospital" appropriation incident to the late intervention in Cuba was \$133,934.46.

The medical supply depot in New York City, which is the main purchasing depot for regular supplies, was badly damaged by fire on the morning of November 17, 1908. The estimated damage to supplies was placed at \$73,753.27. A special appropriation of \$50,000 to replace these supplies was obtained in the act making the appropriation for the support of the army for the fiscal year ending June 30, 1910. The building occupied by the depot was so badly damaged by this fire that it was found necessary to rent another building. A suitable structure was found on West street and the transfer of the depot was accomplished under a great many difficulties. The new building is admirably adapted for a supply depot.

The assembling of field equipment has been continued during the past year and valuable additions have been made to the supplies already in store. The expenditure for this purpose during the year was \$322,976. This includes the special appropriation of \$200,000 given by Congress in the bill making appropriation for the army for the fiscal year 1909, the appropriation "Replacing medical supplies" accumulated during the fiscal year ending June 30, 1908, and the small amount that could be spared from the regular appropriation. I consider the assembling of field supplies which can not be obtained in the market in case of emergency one of the most important duties of this office. The department is now confronted with the serious question of storage facilities for these supplies. The two large store-rooms at the powder depot, St. Louis, are almost filled, and the field supply depot on Pennsylvania avenue, in this city, is also filled. The question of additional storage room must be taken up very soon.

During the year an automatic fire-extinguishing system has been installed in the field supply depot, this city.

The Philippine Islands continue to make heavy demands on the department for medical supplies. During the year ending June 30, 1909, supplies to the amount of \$62,001.28 were shipped to the supply officer, Manila. This does not include the sum of \$60,000 allowed the chief surgeon of the Philippines Division to meet the incidental expenses of the division.

During the year a new ambulance much superior to the old one was recommended by the transportation board, convened by paragraph 5, General Orders, No. 262, War Department, November 7, 1907, and adopted. About 12 old-pattern ambulances have been remodeled to meet the specifications of the new model.

Standard medical supplies for the equipment of the organized militia were issued during the year to States and Territories to the amount (first cost) of \$26,399.99, these supplies remaining the property of the United States. In addition, army medical property was sold to the States for the same purpose to the amount of \$3,196.50, title passing to the States. The medical issues from stock for the use of the Isthmian Canal Commission during the year amounted to \$10,420.44, while transfers to various other branches of the public service totaled \$2,603.88. Other sales for cash, as authorized by existing law and regulations, were made to the amount of \$3,539.94.

All the issues and transfers referred to are enumerated in the detailed tables given below, together with such of the cash sales as were of record June 30. Settlements were not effected for some of the issues, transfers, and sales in question until after the close of the fiscal year. The amounts here noted will be found, therefore, to be greater than those given for the same heads in the financial statement which appears elsewhere in this report, the latter covering settled transactions only.

A. Supplies issued to States and Territories for use of the organized militia, under section 1661, Revised Statutes, and appropriations supplementary thereto:

Alabama.....	\$797. 48
Arkansas.....	1, 110. 03
California.....	95. 20
Connecticut.....	594. 20
Delaware.....	. 75
Georgia.....	680. 00
Illinois.....	2, 537. 34
Indiana.....	16. 53
Iowa.....	1, 196. 02
Kansas.....	366. 88
Maine.....	576. 71
Maryland.....	101. 52
Massachusetts.....	1, 919. 20
Michigan.....	1, 187. 96
Minnesota.....	450. 84
Mississippi.....	204. 00
Missouri.....	3, 892. 67
Nebraska.....	93. 33
New Jersey.....	415. 32
New York.....	2, 978. 56
North Carolina.....	421. 77
Ohio.....	1, 899. 11
Oregon.....	227. 35
Pennsylvania.....	. 15
Rhode Island.....	165. 00
South Dakota.....	6. 30
Utah.....	271. 03
Virginia.....	3, 474. 14
Washington.....	206. 60
Wisconsin.....	514. 00
	<hr/>
	\$26, 399. 99

B. Sales to States under section 17, act of January 21, 1903 (32 Stats., 778):

Connecticut.....	153. 36
Massachusetts.....	134. 40
Ohio.....	8. 26
Pennsylvania.....	2, 900. 48
	<hr/>
	3, 196. 50

C. Supplies transferred to other bureaus and departments of the Government:

Bureau of Immigration.....	1, 321. 88
Bureau of Forestry.....	89. 95
Navy.....	144. 24
Quartermaster's Department, U S. Army.....	30. 40
Engineer Department, U. S. Army.....	1, 017. 41
Isthmian Canal Commission.....	10, 420. 44
	<hr/>
	13, 024. 32

D. Sales to the civil government of the Philippine Islands..... 410. 46

E. Sale to the Republic of Cuba..... 1, 395. 10

F. Sale to an officer of the Public Health and Marine-Hospital Service..... 11. 00

G. Sales to civilian employees of the army and civilians..... 1, 723. 38

Total..... 46, 160. 75

BOARD FOR FIELD MEDICAL EQUIPMENT AND TRANSPORTATION.

In addition to the recommendations heretofore made by the field medical equipment board, note of which is made on page 99 of the Surgeon-General's report for 1908, the board has taken up and disposed of the following:

1. TRAVOIS.

The board will recommend that the travois be adopted as a part of the regular field equipment of the Medical Department. The type of travois heretofore used will be recommended, only minor changes having been made by the board. The specifications will call for second-growth hickory as the wood to be used. This is deemed of great importance, since only by the use of the best material can the necessary strength, lightness, and resiliency be secured.

2. TRAVOIS HARNESS.

A simple and comparatively inexpensive harness has been devised for use with the travois. This consists essentially of tugs attached to an adjustable breast collar, a broad leather back strap with loops for the shafts of the travois, and a belly strap. It can be used either with or without the cavalry saddle. The board will recommend that this harness, like the travois, be furnished by the Medical Department.

3. LITTER FITTINGS FOR RAILWAY CARS.

The board secured from Simonis & Co., of London, a number of sets of "Linxweiler" fittings for converting railway cars into hospital cars. These are simple, strong, easily assembled, and compact when "knocked down." They can be used either with ordinary box cars or by removing the seats with passenger day coaches. With these fittings 16 patients can be accommodated in a 36-foot box car or 28 in a day coach. The regular litter is used with these fittings. The price quoted is, in lots of 500 sets, \$75 per set. A "set" will accommodate four patients. The board will probably recommend the adoption of this type, but is now in communication with a German firm which furnishes a somewhat similar device which may prove to be superior in some respects.

[Extract from report of board, dated July 16, 1908.]

* * * * *

It is also recommended that the cost of altering ambulances of the 1900 pattern to conform to the new specifications be ascertained, with a view to converting all ambulances of that pattern now in stock.

It is recommended further that there be constructed such additional number of the new-type ambulance as may be necessary to completely equip the army and provide for such reserve as may be determined upon, or at least that as soon as possible all posts be provided with them to enable medical officers and hospital corps men to familiarize themselves with the new methods of loading and unloading patients made necessary by the alterations.

It is also recommended that all unserviceable, antiquated, and nondescript kinds of ambulances now in use or in storage be disposed of by sale or otherwise.

* * * * *

ARMY MEDICAL MUSEUM.

The total number of specimens in the museum at the end of the fiscal year, June 30, 1909, is 34,338.

The following statement shows in detail the additions and changes in the different sections.

Pathological section:	
In museum June 30, 1908.....	12, 970
Discarded.....	147
	<hr/>
	12, 823
Received during the year.....	152
	<hr/>
In museum June 30, 1909.....	12, 975
	<hr/>
Anatomical section:	
In museum June 30, 1908.....	1, 202
Discarded.....	3
	<hr/>
	1, 199
Received during the year.....	1
	<hr/>
In museum June 30, 1909.....	1, 200
	<hr/>
Section of comparative anatomy:	
In museum June 30, 1908.....	696
Discarded.....	2
	<hr/>
In museum June 30, 1909.....	694
	<hr/>
Microscopical section:	
In museum June 30, 1908.....	12, 918
	<hr/>
Miscellaneous section:	
In museum June 30, 1908.....	3, 046
Received during the year.....	39
	<hr/>
In museum June 30, 1909.....	3, 085
	<hr/>
Provisional pathological section:	
In museum June 30, 1908.....	695
Discarded and donated.....	149
	<hr/>
In museum June 30, 1909.....	546
	<hr/>
Provisional anatomical section:	
In museum June 30, 1909.....	378
	<hr/>
Photographic section:	
In museum June 30, 1909.....	2, 544
	<hr/>
RECAPITULATION.	
Specimens in museum June 30, 1908.....	34, 447
Discarded and donated.....	301
	<hr/>
	34, 146
Added during the year.....	192
	<hr/>
In museum June 30, 1909.....	34, 338

SUMMARY OF LABORATORY WORK AT THE ARMY MEDICAL MUSEUM.

Total examination in typhoid cases.....	1,436
Suspected typhoid carriers.....	150
No typhoid bacilli found.....	148
Typhoid bacilli found.....	2
(Both were temporary carriers.)	
Widal examinations.....	344
Positive.....	144
Negative.....	200
Blood cultures.....	28
Positive.....	4
Negative.....	24
Cultures from clot.....	157
Positive.....	5
Negative.....	152
Feces from convalescents.....	433
Positive.....	22
Negative.....	411
Urine from convalescents.....	323
Positive.....	7
Negative.....	316

CLINICAL LABORATORY EXAMINATIONS.

Red blood cell and leucocyte counts.....	20
Differential counts.....	13
Examinations for malaria.....	6
Urine analyses.....	175
Examination of sputa.....	42
Examination of feces.....	10
Bacteriological examinations of water.....	72
Bacteriological examinations of cultures, pus, blood, etc.....	27
Autogenous bacterial vaccines prepared.....	35
Animal inoculations for diagnosis, preparation of sera, etc.....	120
Histological examinations of operative specimens distinct from Museum specimens.....	45

CLINICAL LABORATORY EXAMINATIONS.

A mailing package has been adopted which makes it possible to send safely samples of blood, urine, and feces through the mails for examination in one of the larger service laboratories.

It is highly desirable that these examinations be made as soon after the specimens are collected as possible, and laboratories have been established at San Francisco, Cal., and Fort Leavenworth, Kans., for the purpose of conducting these examinations in addition to the laboratory of the Surgeon-General's office. Other laboratories for infectious diseases will be established at central points as they are needed.

No convalescents from typhoid fever are now returned for duty to their organizations until it has been shown that they are not excreting typhoid bacilli in their urine and feces.

A similar examination of the urine and feces of all recruits who give a history of having had the disease is made before they are sent away from the recruiting stations.

No chronic bacillus excretors have been discovered up to the present time.

LIBRARY OF THE SURGEON-GENERAL'S OFFICE.

The following table shows the additions made to the library during the fiscal year 1908-9:

Description.	On hand June 30, 1908.	Added dur- ing fiscal year.	Total June 30, 1909.
	<i>Volumes.</i>	<i>Volumes.</i>	<i>Volumes.</i>
Medical journals.....	51,246	1,325	52,571
Medical transactions.....	8,214	172	8,386
Bound theses.....	2,544	60	2,604
Bound pamphlets.....	2,886	206	3,092
Other medical books.....	100,452	1,774	102,226
Total.....	165,342	3,537	168,879
Medical theses.....	78,594	3,033	81,627
Medical pamphlets.....	212,752	3,181	215,933
Total.....	291,346	6,214	297,560

There were presented to the library during the year 857 books and 7,862 pamphlets and journals. The most noteworthy gift received was that of Sir T. Lauder Brunton, consisting of 200 bound volumes containing 7,000 pamphlets on pharmacology and other medical subjects. This present of the distinguished pharmacologist, representing as it does a large part of the collection of a lifetime, is a gratifying testimonial of the appreciation in which the Surgeon-General's library is held abroad.

An exhibition illustrating the history of medicine by means of the masterpieces of medical literature and the epoch-making books and pamphlets issued since the invention of printing has been begun. The library has never made a specialty of collecting manuscripts, so this exhibition will consist entirely of printed works. The works of the old masters of medicine—Hippocrates, Galen, Celsus, and Avicenna—will appear in the first Latin or Greek imprints. The books and pamphlets of later years, giving to the world the discoveries of Harvey, Auenbrugger, Jenner, Pinel, Laennec, Beaumont, Morton, Marion Sims, Walter Reed, and many others, will appear in their original form. The whole, when it is completed, will constitute a unique collection.

Volume XIV, second series, of the Index Catalogue, will be ready for distribution at the usual time. The manuscript for Volume XV is in course of preparation.

ARTIFICIAL LIMBS.

Under laws relating to artificial limbs, apparatus, or commutation therefor, orders were given on manufacturers for 163 legs, 3 arms, 1 foot, and 1 apparatus, and commutation certificates were issued for 1,801 cases amputated leg, 1,894 amputated arm, 49 amputated foot, and for 2,181 cases of loss of use of limb.

Under act of June 17, 1870, and subsequent amendments thereto, 23,626 disabled soldiers and sailors have been furnished artificial limbs or apparatus, or have received commutation in money as follows:

Total number benefited to June 30, 1909, 23,626; died, 12,136; dropped from rolls, 592; rejected after one or more payments, 567; remaining on rolls at end of the fiscal year, 10,331.

It is estimated that \$105,000 will be required to pay the claims coming due during the fiscal year ending June 30, 1911.

One hundred and ninety appliances were issued during the fiscal year and 546 trusses were furnished and fitted.

FINANCIAL STATEMENT, 1909.^a

Medical and hospital department, 1909.

Appropriated by act approved May 11, 1908.....	\$700,000.00
Transfer to this head made by the Treasury Department to correct a disbursing error, from "Medical and hospital department, 1908".....	\$31.50
Other refundments during the year.....	15.08
	<hr/> 46.58
Total to be accounted for.....	<hr/> 700,046.58 <hr/>
Disbursed during the year:	
Expenses of medical supply depots.....	1,019.85
Medical and hospital supplies.....	341,600.19
Medical attendance and medicines (except at recruiting stations).....	11,803.28
Medical expenses of recruiting (including medical attendance and medicines at recruiting stations).....	9,307.90
Pay of nurses.....	678.29
Pay of other employees.....	154,932.77
Laundering of hospital linen.....	28,289.26
Expressage.....	117.14
Notary fees.....	69.96
Telephone service, medical department steam laundry, Manila.....	42.00
Water rent, Manila.....	180.34
Gas and electricity for medical apparatus.....	336.56
Unclassified ^b	95.88
	<hr/> 548,473.42
Balances on hand June 30, 1909:	
In United States Treasury and in transit thereto.....	113,725.76
In hands of disbursing officers—	
New York City.....	10,138.55
Washington, D. C.....	9,900.57
St. Louis, Mo.....	1.98
San Francisco, Cal.....	3,670.07
Honolulu, Hawaii.....	12.30
Manila, P. I.....	13,275.76
Transport <i>Kilpatrick</i>	848.17
	<hr/> 151,573.16
Total accounted for.....	<hr/> 700,046.58 <hr/>

^aThe "disbursements" in this statement include settlements with public creditors made by the accounting officers of the Treasury and charged by them to these appropriations.

^bBeing the amount of six vouchers for June, 1909, inadvertently mailed by the disbursing officer in Manila to the payees thereof, not yet received in this office at the date of this compilation, August 19, 1909, and accordingly not available for classification.

Medical and hospital department, 1908.

Balance on hand July 1, 1908, act March 2, 1907	\$39,281.38
Refundments during the year.....	314.00
Total to be accounted for.....	<u>39,595.38</u>

Disbursed during the year:

Expenses of medical supply depots.....	\$146.03
Medical and hospital supplies.....	24,779.45
Medical attendance and medicines (except at recruiting stations).....	4,827.49
Medical expenses of recruiting (including medical attendance and medicines at recruiting stations).....	1,483.95
Pay of nurses.....	40.00
Pay of other employees.....	2,337.19
Laundering of hospital linen.....	2,623.61
Expressage.....	9.92
Telephone service, medical department steam laundry, Manila.....	6.00
Water rent, Manila.....	168.82
Gas and electricity for medical apparatus.....	68.39
	<u>36,490.85</u>
Transfer by the Treasury Department to "Miscellaneous receipts," being the proceeds of private laundry work done for sanitary reasons at the medical department steam laundry, Manila, erroneously credited to this appropriation during the fiscal year 1908.....	2,445.40
Transfer by the Treasury Department to "Medical and hospital department, 1909," to correct disbursing errors.....	31.50
Balance in United States Treasury June 30, 1909.....	627.63
Total accounted for	<u>39,595.38</u>

Medical and hospital department, 1907.

Balance on hand July 1, 1908, act June 12, 1906.....	\$1,162.78
Disbursed during the year:	
Medical and hospital supplies.....	\$140.82
Medical attendance and medicines (not at recruiting stations).....	.65
	<u>141.47</u>
Carried to surplus fund.....	1,021.31
Total accounted for.....	<u>1,162.78</u>

Medical and hospital department, 1906, and prior years.

Refundments during the year.....	\$8.87
Carried to surplus fund.....	8.87

Relief of Joseph W. Parish (act Feb. 17, 1903).

Amount appropriated as per warrant June 30, 1909.....	\$181,358.95
Disbursed by Treasury settlement.....	181,358.95

Replacing medical supplies, 1909-10 (act June 12, 1906—34 Stats., 256).

AMOUNTS ACCRUING TO THIS FUND.

A. On account of supplies transferred:

To Immigration Service.....	\$1,321.88
To Forest Service.....	89.95
To Quartermaster's Department, U. S. Army.....	25.00
To Engineer Department, U. S. Army.....	124.33
To Isthmian Canal Commission.....	10,391.96
To States, for use of militia.....	22,695.54
	<u>\$34,648.66</u>

B. On account of supplies sold:

To States, for use of militia.....	\$3, 188. 24	
To civil government, Philippine Islands.....	410. 46	
To Republic of Cuba.....	1, 395. 10	
To officer of Public Health and Marine-Hospital Service.....	11. 00	
To civilian employees and civilians.....	1, 723. 38	
		\$6, 728. 18

C. On account of collections from carriers and others for medical property lost or destroyed

492. 71

Total to be accounted for.....	41, 869. 55
Balance on hand in United States Treasury June 30, 1909.....	41, 869. 55

Replacing medical supplies, 1908-9.

Balance on hand July 1, 1908.....	\$33, 029. 40
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AMOUNTS ACCRUING TO THIS FUND.

A. On account of supplies transferred:

To Forest Service.....	\$262. 50	
To Engineer Department, U. S. Army.....	91. 62	
To Isthmian Canal Commission.....	3, 824. 63	
To States, for use of militia.....	3, 716. 03	
To relief of cyclone sufferers in Southern States.....	3, 911. 51	
		\$11, 806. 29

B. On account of supplies sold:

To civil government, Philippine Islands.....	2. 33	
To civilian employees and civilians.....	311. 09	
		313. 42

C. On account of collections from carriers and others for medical property lost or destroyed

412. 80

45, 561. 91

Disbursed during the year.....	41, 678. 91
Balance in hands of disbursing officer New York, N. Y., June 30, 1909..	3, 883. 00

Total accounted for.....	45, 561. 91
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Replacing medical supplies, 1907-8.

Balance on hand July 1, 1908.....	\$2, 273. 36
Amounts accrued during the year on account of collections from carriers for medical property lost or destroyed.....	30. 10

Total to be accounted for.....	2, 303. 46
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Disbursed during the year.....	2, 270. 35
Balance in United States Treasury June 30, 1909.....	33. 11

Total accounted for.....	2, 303. 46
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Replacing medical supplies destroyed by fire, 1909-10.

Appropriated by act approved March 4, 1909.....	\$50, 000. 00
Balance in United States Treasury June 30, 1909.....	50, 000. 00

Field medical equipment.

Balance on hand July 1, 1908, act May 11, 1908.....	\$200, 000. 00
Disbursed during the year.....	199, 916. 00

Balance in United States Treasury June 30, 1909.....	84. 00
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Artificial limbs, 1909.

Appropriated by act approved May 27, 1908.....	\$400,000.00
Refunded during the year.....	125.00
Total to be accounted for.....	<u>400,125.00</u>
Disbursed during the year.....	349,138.35
Balances on hand June 30, 1909:	
In United States Treasury.....	\$48,772.65
In hands of disbursing officer, Washington, D. C.....	2,214.00
	<u>50,986.65</u>
Total accounted for.....	400,125.00

Artificial limbs, 1908.

Balance on hand July 1, 1908, act March 4, 1907.....	\$23,060.56
Disbursed during the year.....	<u>3,277.00</u>
Balance on hand June 30, 1909, in United States Treasury.....	19,783.56

Artificial limbs, 1907.

Balance on hand July 1, 1908, act June 30, 1906.....	\$10,120.56
Disbursed during the year.....	40.50
Carried to surplus fund.....	<u>10,080.06</u>
Total accounted for.....	10,120.56

Artificial limbs, 1906 and prior years.

Amount of warrant under act of March 3, 1875 (18 Stats., 418).....	\$146.00
Transfer to "Transportation of the army and its supplies, 1906," for transportation furnished a beneficiary of the artificial-limb laws conformably to act August 15, 1876 (19 Stats., 204).....	146.00

Appliances for disabled soldiers, 1909.

Appropriated by act approved May 27, 1908.....	\$2,000.00
Disbursed during the year.....	<u>1,353.30</u>
Balance on hand June 30, 1909:	
In United States Treasury.....	\$600.00
In hands of disbursing officer, Washington, D. C.....	46.70
	<u>646.70</u>

Appliances for disabled soldiers, 1908.

Balance on hand July 1, 1908, act March 4, 1907.....	\$786.24
Disbursed during the year.....	<u>99.25</u>
Balance on hand June 30, 1909, in United States Treasury.....	686.99

Appliances for disabled soldiers, 1907.

Balance on hand July 1, 1908, act June 30, 1906.....	\$756.61
Carried to surplus fund.....	<u>756.61</u>

Army Medical Museum, 1909.

Appropriated by act approved May 11, 1908.....	\$5,000.00
Disbursed during the year.....	<u>3,153.10</u>
Balances on hand June 30, 1909:	
In United States Treasury.....	\$992.85
In hands of disbursing officer, Washington, D. C.....	854.05
	<u>1,846.90</u>

Army Medical Museum, 1908.

Balance on hand July 1, 1908, act March 2, 1907.....	\$1,589.58
Disbursements during the year.....	1,182.20

Balance on hand June 30, 1909, in United States Treasury.....	407.38
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Army Medical Museum, 1907.

Balance on hand July 1, 1908, act June 12, 1906.....	\$9.53
Carried to surplus fund.....	9.53

Library, Surgeon-General's Office, 1909.

Appropriated by act approved May 11, 1908.....	\$10,000.00
Disbursed during the year.....	5,917.15

Balances on hand June 30, 1909:

In United States Treasury.....	\$2,980.77	
In hands of disbursing officer, Washington, D. C.....	1,102.08	
		4,082.85

Library, Surgeon-General's Office, 1908.

Balance on hand July 1, 1908, act March 2, 1907.....	\$4,160.16
Disbursements during the year.....	3,635.95

Balance on hand June 30, 1909, in United States Treasury.....	524.21
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Library, Surgeon-General's Office, 1907.

Balance on hand July 1, 1908, act June 12, 1906.....	\$208.98
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Disbursed during the year.....	2.50
Carried to surplus fund.....	206.48

Total accounted for.....	208.98
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Furnishing trusses to disabled soldiers, indefinite appropriation (secs. 1176, 1177, and 1178, R. S., and act of Mar. 3, 1879).

Balance on hand July 1, 1908.....	\$2,500.37
Drawn during the year.....	1,809.00

Total to be accounted for.....	4,309.37
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Disbursements during the year.....	3,959.14
Balance June 30, 1909, in hands of disbursing officer, Washington, D. C..	350.23

Total accounted for.....	4,309.37
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General summary of all appropriations.

Balances on hand July 1, 1908.....	\$318,939.51
Appropriated.....	1,350,167.95
Proceeds of sales, etc., accruing to replacing funds, act June 12, 1906 (34 Stats., 256).....	54,432.16
Refunded during the year.....	608.95

Total to be accounted for.....	1,724,148.57
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Disbursed during the year.....	1,382,234.39
Transferred to "Miscellaneous receipts".....	2,445.40
Carried to surplus fund.....	12,082.86
Balances on hand June 30, 1909.....	327,385.92

Total accounted for.....	1,724,148.57
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Very respectfully,

The SECRETARY OF WAR.

GEO. H. TORNEY,
Surgeon-General U. S. Army.

REPORT OF THE PAYMASTER-GENERAL.

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REPORT OF THE PAYMASTER-GENERAL.

WAR DEPARTMENT, OFFICE OF THE PAYMASTER-GENERAL, *Washington, October 1, 1909.*

SIR: I have the honor to submit the following report for the fiscal year ended June 30, 1909:

On July 1, 1908, officers of the Pay Department were charged with public funds aggregating.....	\$3, 655, 882. 72
During the fiscal year these officers received:	
From the United States Treasury.....	44, 309, 325. 58
From soldiers' deposits.....	1, 861, 198. 53
From army paymasters' collections.....	1, 012, 181. 65
Total balances and receipts.....	50, 838, 588. 48
Accounted for as follows:	
Expended on account of pay of the army.....	41, 430, 957. 65
Expended on account of mileage to officers and contract surgeons..	499, 768. 03
Expended on account of Army War College.....	15, 072. 69
Expended on account of pay of Military Academy.....	555, 233. 34
Expended on account of pay of soldiers' deposits.....	1, 441, 488. 53
Expended on account of encampment and maneuvers, organized militia.....	294, 336. 72
Total expenditures.....	44, 236, 856. 96
Surplus funds deposited to credit of United States Treasurer.....	865, 709. 59
Soldiers' deposits deposited to credit of United States Treasurer.....	1, 861, 198. 53
Army paymasters' collections deposited to credit of United States Treasurer.....	1, 012, 181. 65
Balance charged to officers June 30, 1909.....	^a 2, 862, 641. 75
Total accounted for.....	50, 838, 588. 48

The appropriations for the pay of the army and the Military Academy, for expenses of the Army War College, and allotment of funds for the payment of the militia under section 15 of the act of January 21, 1903, amounted to \$44,383,441.39 for the fiscal year. The gross accountability involved in the transactions of the disbursing officers and special disbursing agents are shown by the table hereafter appearing in this report.

Detailed statements of the transactions of all officers in this department are appended hereto. The payments to the army in the United States and in our outlying possessions have been made with promptness, and it is a pleasure to commend the officers and clerks for their faithfulness in the various duties intrusted to them.

^a The balance of \$2,862,641.75 charged to officers on June 30, 1909, was needed for the muster of June 30, paid during the month of July.

The only loss during this fiscal year occurred at an interior post in Alaska, and amounted to \$9,941.40. The officer responsible for these funds was a line officer acting at the time as a special disbursing agent of the Pay Department.

A board of officers appointed for the purpose of making an investigation of the shortage and determining the responsibility therefor reported in effect that they were unable to determine when or where the loss occurred, or who actually took the funds. The evidence, however, pointed to the guilt of an enlisted man who was performing clerical duty for the special disbursing agent and who deserted just prior to the discovery of the loss.

ALLOTMENTS.

The fiscal year 1909 has shown a material increase in the number of allotments of pay by enlisted men over that for the prior fiscal year.

For the month of June, 1909, there were in force 3,828 allotments, aggregating \$47,571.57. This was an increase of 1,515 in allotments and \$18,685.57 in the amount disbursed thereon over the month of June, 1908. The total amount disbursed on account of allotments from July 1, 1908, to June 30, 1909, was \$491,304.55.

It is again recommended that so much of section 16 of the act of March 2, 1899 (30 Stat., 981), as permits enlisted men to make allotments of pay "for their own savings, or for other purposes," be repealed, thereby restricting the allotment privileges to support of families or relatives. This restriction would not operate detrimentally upon the soldier as he is afforded every facility for saving through deposit with an army paymaster under the provisions of section 1305, Revised Statutes.

ARMY OF CUBAN PACIFICATION.

On February 16, 1907, the Secretary of War instructed the Paymaster-General to render a monthly statement of all expenditures to the Chief of the Bureau of Insular Affairs, War Department. These reports have been rendered promptly. The movement to Cuba commenced in October, 1906, and ended on the final evacuation, April 1, 1909. The total expenditures by the Pay Department were \$744,890.90.

I quote from Major-General Barry's report of 1909:

The work of the personnel of the Pay Department was complete and satisfactory, and on the final evacuation, April 1, every account that could be settled to include March 31, 1909, was paid. All funds remaining on hand after the final payment were transferred to the Treasurer of the United States, and the work of the Pay Department completed before sailing for the United States.

Maj. James B. Houston, paymaster, was the chief paymaster at date of evacuation.

BENEFICIARY PAYMENTS.

The act of Congress approved May 11, 1908, contains the provision:

That hereafter immediately upon official notification of the death from wounds or disease contracted in line of duty of any officer or enlisted man on the active list of the army, the Paymaster-General of the army shall cause to be paid to the widow of such officer or enlisted man, or to any other person previously designated by him, an amount equal to six months' pay at the rate received by such officer or enlisted man at the date of his death, less seventy-five dollars in the case of an officer and thirty-five

dollars in the case of an enlisted man. From the amount thus reserved the Quartermaster's Department shall be reimbursed for expenses of interment, and the residue, if any, of the amount reserved shall be paid subsequently to the designated person. The Secretary of War shall establish regulations requiring each officer and enlisted man to designate the proper person to whom this amount shall be paid in case of his death, and said amount shall be paid to that person from funds appropriated for the pay of the army.

This act was amended by Congress on March 3, 1909, by striking out the words "contracted in line of duty," and inserting in lieu thereof the words, "not the result of his own misconduct," but such amendment has been construed by the Comptroller of the Treasury as being purely prospective and as not applicable to cases where death occurred on or before March 2, 1909.

During the fiscal year, July 1, 1908, to June 30, 1909, the Pay Department has disbursed \$25,833.25 to the beneficiaries of officers, and \$21,355.01 to the beneficiaries of enlisted men, making a total disbursement of \$47,188.26.

These payments have all been made with the utmost promptness.

CLERKS, PAYMASTER-GENERAL'S OFFICE.

Attention was called in the last report to the fact that no change had been made in salaries of clerks in this office since 1870. The Paymaster-General again most earnestly recommends that an increase in the various classes be made to all government clerks at an early day. The success of this office is largely due to the faithful labors of these clerks, and it is believed that they have earned the financial recognition recommended.

One of the prominent mercantile agencies has recently reported that since 1896 there has been an increase of 49 per cent in the cost of living expenses, and consequently each year the burden falls heavier upon these salaried employees.

The estimates for salaries in the executive departments and establishments, prepared by the committee on grades and salaries under executive order of June 11, 1907, have been published in House of Representatives Document No. 648, Sixtieth Congress, first session, and in my opinion represent a very close approximation of what is desired and merited in way of reclassification of grades and salaries. As stated in my former report, it is earnestly recommended that these estimates be given favorable consideration by Congress during the coming session.

I am in hearty sympathy with the present movement, which has for its object the retirement of clerks with reasonable compensation after they have reached an age which incapacitates them for the performance of their full duties.

DETAIL SYSTEM.

Under section 26 of the act approved February 2, 1901, vacancies occurring in certain specified staff departments are filled by four-year details of line officers of corresponding rank, and by the operation of this act all of the captains and six majors of the Pay Department of the army are now detailed officers.

Three former Paymasters-General have recommended that the application of the detail system in the Pay Department be restricted

to captains, and that the higher grades be made permanent. I fully concur in their recommendations.

The promotions to major should be made from the captains who have served, or who may be serving, a detail in the Pay Department, and who have shown the greatest proficiency in their work.

MILITIA.

Under section 15 of the act of January 21, 1903, and the amendment thereof by the act of May 27, 1908, militia organizations of the several States and Territories and the District of Columbia participating in operations at maneuver camps or in joint exercises at lake or seacoast defenses are paid by the Pay Department from funds specifically appropriated by Congress for such purpose.

Between July 1, 1908, and June 30, 1909, militia organizations participated in joint seacoast defense exercises at various posts in the departments of the East and Gulf, and also in joint field maneuvers at Pine Camp, N. Y.; Chickamauga Park, Ga.; Fort Benjamin Harrison, Ind.; Fort Riley, Kans.; Camp Emmet Crawford, Wyo.; Leon Springs, Tex.; American Lake, Wash.; and Atascadero, Cal.

There was disbursed for the pay of these militia troops a total of \$294,336.72, pertaining to the appropriations "Encampment and maneuvers, organized militia, 1908," \$13,867.64; "Encampment and maneuvers, organized militia" (no year), \$253,546.34; and "Encampment and maneuvers, organized militia, 1909-1911," \$26,922.74.

Army paymasters were on duty at the places of joint exercises and encampments for the purpose of making payment to the militia organizations and giving instructions relative to the preparation and extension of pay rolls.

PAYMASTERS' CLERKS.

The paymasters' clerks have well and faithfully performed their duties during the past year, and it affords me pleasure to commend them and to again recommend some congressional action in their behalf, as outlined in my annual report for 1908.

During this fiscal year 3 paymasters' clerks have resigned, making 42 resignations during the past eight years, 23 of which were to accept better positions, 11 for personal reasons not known to the department, and 8 because ordered to the Philippine Islands. These resignations have all come from men having considerable service, and unless some action is taken to make the emoluments of the service more commensurate with the requirements of the position, the department will be constantly subject to a continuation of this loss of its best trained men and accountants.

The military committees of the Senate and the House of Representatives have both reported a bill for their benefit, which, if enacted, would unquestionably establish a permanency of the force, and thereby greatly increase the efficiency of the department.

SOLDIERS' DEPOSITS.

The benefit of the army deposit system to enlisted men is universally recognized. It encourages a spirit of thrift and saving which unquestionably elevates the standard of the enlisted men.

The subjoined table sets forth deposits and repayments for the fiscal years since the system was established.

The rate of interest on these deposits is 4 per cent per annum, repaid only to the soldier on his discharge from the service.

It is gratifying to note that there was an increase of \$184,489.85 for 1909 over 1908.

Number and amounts of deposits received from and repaid to soldiers on discharge from July 1, 1872, to June 30, 1909.

Fiscal year ending June 30—	Deposits received.		Deposits repaid.		
	Number.	Amount.	Number.	Principal.	Interest.
1873.....		\$209,850.38			
1874.....		346,609.56			
1875.....		325,255.80			
1876.....		435,912.68			
1877.....	5,524	328,585.05	14,752	\$1,041,001.57	\$49,713.89
1878.....	5,524	346,243.94	3,182	145,667.91	88,420.24
1879.....	6,087	470,770.38	4,926	257,854.48	17,706.93
1880.....	8,635	477,174.44	8,084	392,568.93	30,680.97
1881.....	8,942	524,112.72	8,148	501,949.77	38,722.62
1882.....	6,890	448,561.83	7,570	428,482.44	31,658.73
1883.....	7,902	407,544.68	6,695	363,578.34	26,123.60
1884.....	7,114	389,267.55	8,184	404,291.57	31,124.93
1885.....	7,033	427,617.96	6,930	401,902.22	38,249.44
1886.....	7,261	469,031.55	7,835	490,506.79	46,583.23
1887.....	6,889	436,574.98	6,988	389,083.12	34,758.24
1888.....	7,409	388,944.10	6,346	323,952.97	29,327.01
1889.....	7,892	383,798.34	7,664	396,468.53	33,647.38
1890.....	7,634	395,128.82	7,206	411,039.74	41,596.60
1891.....	6,790	403,473.15	9,106	553,047.45	51,797.70
1892.....	5,570	334,464.70	8,019	410,873.15	38,894.26
1893.....	5,870	282,248.04	5,317	268,835.46	26,069.07
1894.....	5,914	361,830.76	5,786	290,088.98	27,014.32
1895.....	6,284	318,270.73	5,880	308,372.45	28,766.42
1896.....	8,778	420,338.87	6,486	359,200.43	38,614.66
1897.....	17,878	535,392.64	6,976	345,559.55	34,850.53
1898.....	21,856	613,513.51	17,377	561,518.64	45,815.61
1899.....	37,842	1,496,762.31	28,508	988,774.63	61,273.95
1900.....	91,461	3,215,544.66	27,571	1,028,146.34	43,234.89
1901.....	111,004	3,438,529.11	78,948	2,955,169.39	114,750.37
1902.....	80,833	2,660,250.66	129,271	3,708,820.19	190,957.77
1903.....	61,948	1,888,014.37	59,968	2,134,191.91	123,298.48
1904.....	59,970	1,585,687.60	62,198	1,838,105.64	107,032.95
1905.....	51,382	1,531,019.80	74,352	2,010,526.80	122,205.52
1906.....	54,266	1,495,228.04	35,899	1,168,236.62	70,112.93
1907.....	61,908	1,572,204.04	46,696	1,203,746.47	68,879.02
1908.....	50,896	1,676,708.68	69,120	1,902,552.80	124,029.82
1909.....	60,385	1,861,198.53	48,831	1,450,391.08	85,267.64
Total.....		32,899,664.96		29,434,506.36	1,941,169.72
Amount remaining to credit of depositors.....		3,465,158.60			

NOTE.—Repayment of deposits to soldiers from July 1, 1872, to June 30, 1876, were not recorded by fiscal years. The repayments of 1877 include all deposits repaid prior thereto.

The above table gives a complete history of soldiers' deposits since the passage of the act authorizing them, May 15, 1872.

PERSONNEL.

The following changes in Pay Department personnel occurred between July 1, 1908, and June 30, 1909.

PROMOTED.

Lieut. Col. Harry L. Rogers, deputy paymaster-general, promoted colonel and assistant paymaster-general March 4, 1909.

Maj. George F. Downey, promoted lieutenant-colonel and deputy paymaster-general March 4, 1909.

RETIRED.

Col. William F. Tucker, assistant paymaster-general, March 4, 1909, for disability incident to the service.

Maj. James W. Dawes, paymaster, January 8, 1909, by operation of law.

DIED.

Maj. Bradner D. Slaughter, paymaster, May 8, 1909.

DETAILS FROM THE LINE.

Capt. Charles W. Castle, infantry, July 31, 1908.

Capt. James J. Hornbrook, cavalry, September 17, 1908.

Capt. Robert C. Williams, cavalry, December 31, 1908.

Maj. Franklin O. Johnson, cavalry, January 8, 1909.

Capt. William T. Wilder, infantry, February 3, 1909.

Maj. Morris K. Barroll, coast artillery corps, April 14, 1909.

Capt. Melville S. Jarvis, infantry, April 11, 1909.

Capt. Eleutheros H. Cooke, infantry, May 13, 1909.

RELIEVED.

Capt. Frank D. Ely, infantry, July 31, 1908, at his own request.

Capt. Henry B. Dixon, cavalry, September 17, 1908, on completion of four years' detail.

Capt. William S. Valentine, cavalry, December 31, 1908, at his own request.

Capt. Earl C. Carnahan, infantry, February 3, 1909, on completion of four years' detail.

Capt. Thomas M. Moody, infantry, April 11, 1909, on completion of four years' detail.

Capt. George J. Holden, infantry, May 13, 1909, on completion of four years' detail.

Respectfully submitted,

CHAS. H. WHIPPLE,
Paymaster-General, U. S. Army.

The SECRETARY OF WAR.

Mileage disbursements for the fiscal year ended June 30, 1909.

	Appropriations.		
	1907.	1908.	1909.
Inspection of the army:			
By the generals commanding departments, accompanied by officers of their staffs, as provided by paragraph 191, Army Regulations.....		\$142.08	\$5,218.98
By officers of the general staff corps.....			956.08
By officers of the Inspector-General's Department.....		177.70	9,321.03
By officers of the Quartermaster's Department.....		447.84	13,650.70
By officers of the Subsistence Department.....		237.40	6,559.02
By officers of the Medical Department.....		130.35	2,627.92
By officers of the Corps of Engineers.....		47.85	1,200.26
By officers of the Ordnance Department.....		33.77	8,168.59
By officers of the Signal Corps.....		556.83	2,550.12
By officers of the Coast Artillery Corps.....		147.42	3,266.67
Inspection of:			
Colleges.....			1,867.61
Horses.....		338.04	5,532.26
Militia.....		539.02	12,321.30
Troops.....		37.06	799.16
Work on fortifications by engineer officers.....		5.52	2,106.08
Special inspections.....		16.80	96.49
Total for inspection of the army.....		2,857.68	76,242.27

Mileage disbursements for the fiscal year ended June 30, 1909—Continued.

	Appropriations.		
	1907.	1908.	1909.
General recruiting duty.....		\$5,556.85	\$47,753.56
Joining for and returning from recruiting duty.....		557.97	9,572.80
Returning from conducting recruits.....			1,482.56
Total for recruiting.....		6,114.82	58,808.92
Change of station.....	\$34.69	8,621.80	130,569.27
General Service and Staff College, Fort Leavenworth, Kans.....			4,406.38
Travel of general officers and their aids other than for inspection.....			1,206.33
Travel in Europe and other foreign countries.....	13.58	459.38	2,928.51
Courts-martial and courts of inquiry.....		1,143.59	18,102.77
Payment of troops.....		335.81	14,624.07
Test of horsemanship.....		8.47	9,380.17
Officers ordered to express offices to obtain money for payment of troops.....		27.72	144.13
Treasurer and professors, Military Academy.....		15.12	308.84
Instructions of Secretary of War (confidential duty).....		702.32	1,374.45
Target practice, target ranges, and rifle teams.....	8.39	759.58	35,992.58
Conducting prisoners, sick and insane.....	2.38	196.40	3,334.16
Pursuit of deserters and escaped prisoners.....			6.08
Line officers on business for Quartermaster's and Subsistence departments.....		194.62	2,423.65
Retiring boards and officers retired and ordered home.....		1,656.56	9,170.52
Boards to examine officers for promotion.....		1,344.76	30,086.83
Boards for examination of gunners.....			264.79
Boards of survey.....		32.80	126.36
Board on General Staff.....			759.08
Board for considering questions pertaining to the protection of seacoast forts from attack by land.....		385.70	808.50
Board on revising Manual for Army Cooks.....			91.42
Board on military posts, fortifications, and buildings.....			1,083.24
Board on increase of efficiency of chaplains.....			642.29
Board on immunizing the Regular and, in case of war, the Volunteer Army against typhoid fever.....			211.12
Board on recruiting service.....			1,071.42
Board on infantry equipments.....			522.38
Board on organization of service-school detachments.....			375.78
Board of Ordnance and Fortification.....			129.64
Military aeronautics.....			1,297.06
Leases and other legal business.....		14.14	327.02
Topographical work.....		296.94	2,502.80
Military surveys.....			213.57
Acting as judges at the annual contest First Aid Corps, Pennsylvania Coal Co.....			70.98
Consultation with division or department commanders.....		80.96	129.29
Consultation with the Quartermaster-General.....			31.92
Consultation with the Chief of Staff.....			32.14
Consultation with The Adjutant-General.....			32.14
Special investigations.....		45.70	378.74
Fire control and installation.....		33.18	929.16
War College, attending and delivering lectures.....		417.51	2,072.75
Naval War College, delivering lectures.....		55.02	165.06
Army of Cuban pacification.....		328.39	13,216.57
Joint army and militia coast-defense exercises.....		1,278.27	3,052.59
Army maneuvers.....		1,153.48	20,695.44
Conducting religious services.....			88.86
Travel for medical or dental treatment.....		684.36	9,153.72
Coast Artillery School, Fort Monroe, Va.....			1,758.63
Relief of sufferers from cyclone which occurred in the Southern States April 24, 1908.....		124.53	343.52
Attending funerals.....			14.88
Attending cavalry school at Saumur, France.....			318.88
Attending tercentennial exposition, founding of Quebec.....			106.12
Attending American Public Health Association.....			198.20
Attending American Bar Association.....			84.90
Attending American Veterinary Medical Association.....			151.92
Attending Association Military Surgeons.....			287.50
Attending British Army Medical School, London, England, and Institution for Infectious Diseases, Berlin, Germany.....		36.00	88.42
Attending Esperanto Congress, Dresden, Germany.....			431.23
Attending Army Service School, Aldershot, England.....			331.78
Attending American Prison Association.....			186.08
Attending International Congress on Tuberculosis.....			317.86
Attending International Congress on the Application of Electricity.....			494.93
Attending International Congress of the War of Independence and its Epoch, in the city of Zaragoza, Spain.....			115.22

*The mileage appropriation will be reimbursed from the appropriation for sufferers from cyclone in Southern States.

Mileage disbursements for the fiscal year ended June 30, 1909—Continued.

	Appropriations.		
	1907.	1908.	1909.
Attending First International Congress on the Adaptation of Roads to the New Modes of Locomotion			\$319.87
Attending French army maneuvers			66.22
Attending German army maneuvers		\$30.51	41.02
Attending National Cannery Association			42.56
Attending ceremonies at Gettysburg, Pa., May 31, 1909			335.18
Attending conference Young Men's Christian Association			76.72
Attending dedication of statue to Gen. S. D. Lee			185.72
Attending American Medical Association			109.20
Attending unveiling monument at Petersburg, Va.			19.32
Attending meeting of Medical Society County of New York			31.92
Attending American Society Tropical Medicines			185.78
Accompanying President to New Haven and return			24.32
Accompanying Secretary of War to Charleston, S. C., and return			82.60
Accompanying special Chinese ambassador to Washington, D. C.			457.54
Participating in military display at the two hundred and twenty-fifth anniversary of the city of Philadelphia, Pa.			51.84
Alaska-Yukon-Pacific Exposition			110.46
Alaskan Road Commission			317.37
Staff ride of student officers, Fort Leavenworth, Kans			55.37
Panama Canal			6.37
Military tournaments			2,574.38
Participating in inaugural parade			57.96
Duty not stated		8.80	277.92
Amounts	\$59.04	29,444.92	470,205.47
			29,444.92
			59.04
Total Pay Department disbursements during fiscal year 1909			499,709.43
Paid by Auditor for the War Department on Treasury settlements and chargeable to mileage appropriations	278.58	556.20	158.08
			556.20
			278.58
Aggregate, Pay Department and Auditor for War Department			500,702.29

Statement of the account of the Pay Department, United States Army, with the appropriations subject to its control during the fiscal year ending June 30, 1909.

Appropriations.	In account with the Treasury.					Total.
	Balance in the Treasury July 1, 1908.	Amount of appropriations and transfer warrants.	Unexpended balances deposited.	Paymasters' collections deposited.	Repayments in settlement of accounts.	
Pay, etc., of the army, 1909.....	\$1,500.00	\$43,051,966.83	\$21,197.69	\$590,963.87	\$306.32	\$43,664,434.71
Pay, etc., of the army, 1908-9.....		600,000.00	97.04	1,022.56	4.34	1,500.00
Mileage to officers and contract surgeons, 1909.....		618,750.12	161.00	36.67		618,947.79
Pay of Military Academy, 1909.....		15,000.00				15,000.00
Army War College, 1909.....		80,182.07				80,182.07
Encampment and maneuvers, organized militia, 1909-1911.....		30,582.00	25,205.87	10.00		215,168.80
Encampment and maneuvers, organized militia.....		1,890,910.66	507.42			4,627,785.70
Pay of the army deposit fund.....	2,736,367.62	123,873.05	761,338.86	135,896.87	682.32	1,122,650.62
Pay, etc., of the army, 1908.....	100,859.52	123,373.71	1,622.94	1,234.65	15,154.93	1,854.46
Mileage to officers and contract surgeons, 1908.....	1,468.23	599.40	4,600.00			110,668.06
Pay of Military Academy, 1908.....	105,468.66					858.08
Army War College, 1908.....						13,177.37
Encampment and maneuvers, organized militia, 1908.....			13,177.37			980,990.07
Pay, etc., of the army, 1907.....	865,306.36	3,116.01	108,576.55	3,525.87	465.26	18,549.34
Encampment and maneuvers, organized militia, 1907.....	18,549.34					1,590.26
Mileage to officers and contract surgeons, 1907.....	34,780.04	519.89	490.51	27.92		34,780.04
Pay of Military Academy, 1907.....						142.89
Army War College, 1907.....	142.89					11,071.72
Pay, etc., of the army, 1906 and prior years.....		762.88	9,453.28	596.37	214.18	1,071.72
Mileage to officers and contract surgeons, 1906 and prior years.....		1.00	1,069.04	1.68		41.38
Pay of Military Academy, 1906.....		41.38				668.05
Pay, etc., of the army, 1906.....		668.05				298.39
Mileage to officers and contract surgeons, 1906.....		298.39				1,061.19
Pay, etc., of the army, 1905 and prior years.....		1,061.19				249.31
Pay, etc., of the army, 1904.....		249.31				
Total.....	4,025,223.63	46,418,955.94	947,497.57	733,316.46	16,827.35	52,141,820.95

Statement of the account of the Pay Department, United States Army, with the appropriations subject to its control during the fiscal year ending June 30, 1909—Continued.

Appropriations.	In account with the Treasury.					Balance in the hands of paymasters June 30, 1909.	Total balances June 30, 1909.
	Amount drawn by requisition.		Amount covered into surplus fund.	Total.	Balance in the Treasury June 30, 1909.		
	On Pay Department request.	On Treasury settlements.					
Pay, etc., of the army, 1909.....	\$41,564,900.00	\$25,868.80		\$41,590,768.80	\$2,073,665.91	\$2,509,390.29	\$4,583,056.20
Pay, etc., of the army, 1908-9.....	1,500.00			1,500.00			130,119.10
Mileage to officers and contract surgeons, 1909.....	512,300.00	184.21		512,484.21	88,639.73	41,479.37	95,137.46
Pay of Military Academy, 1909.....	555,000.00	151.53		555,151.53	63,796.26	31,341.20	2,296.40
Army War College, 1909.....	14,500.00	21.00		14,521.00	479.00	1,817.40	53,259.33
Encampment and maneuvers, organized militia, 1909-1911.....	61,600.00			61,600.00	18,582.07	34,677.26	2,018.20
Encampment and maneuvers, organized militia.....	190,063.42	25,055.20		215,148.62	20,18	1,998.02	3,497,091.79
Pay of the army deposit fund.....	1,199,000.00	148,232.35		1,347,232.35	3,290,553.35	216,538.44	566,005.30
Pay, etc., of the army, 1908.....	191,800.00	387,844.80		579,144.80	543,505.82	22,490.48	6,673.38
Mileage to officers and contract surgeons, 1908.....	15,000.00	1,016.59		16,016.59	3,837.87	2,835.51	108,631.59
Pay of Military Academy, 1908.....	2,000.00	101.25		2,101.25	108,566.81	64.78	13,177.37
Army War College, 1908.....	632.16	197.38		829.54	28.54		
Encampment and maneuvers, organized militia, 1908.....					13,177.37		
Pay, etc., of the army, 1907.....	1,000.00	123,260.98	\$856,729.09	980,990.07			
Encampment and maneuvers, organized militia, 1907.....			18,549.34	18,549.34			
Mileage to officers and contract surgeons, 1907.....		447.27	1,142.90	1,590.26			
Pay of Military Academy, 1907.....		28.61	34,751.43	34,780.04			
Army War College, 1907.....			142.89	142.89			
Pay, etc., of the army, 1906 and prior years.....		48.18	10,978.53	11,026.71			
Mileage to officers and contract surgeons, 1906 and prior years.....			1,071.72	1,071.72			
Pay of Military Academy, 1906.....		41.38		41.38			
Pay, etc., of the army, 1906.....		3.73	664.32	668.05			
Mileage to officers and contract surgeons, 1906.....			298.39	298.39			
Pay, etc., of the army, 1905 and prior years.....		1,057.46	8.73	1,066.19			
Pay, etc., of the army, 1904.....			249.31	249.31			
Total.....	44,309,325.58	713,060.72	924,581.74	45,946,968.04	6,194,852.91	2,862,641.75	9,057,494.66

Statement showing the balance in the hands of each disbursing officer of the Pay Department, States Treasury, or turned over by other agents during the fiscal year ending June 30, or replacement in the Treasury, and the balance remaining in the hands of paymasters to

Rank and name.	Balance in hands of each paymaster on June 30, 1908.	Remitted from the Treasury in the year ending June 30, 1909.	Received from other paymasters.	Received from paymaster's collections.	Received from soldiers' deposits.	Total received and to be accounted for.
<i>Colonels and assistant paymasters-general.</i>						
Comegys, W. H.	\$104,377.97	\$6,655,500.00	\$956,249.10	\$1,645.64	-----	\$7,717,772.71
Smith, G. R.	162,255.72	4,338,000.00	168,142.30	1,923.45	-----	4,670,321.47
Rogers, H. L.	267,774.86	3,709,100.00	1,373,412.80	2,880.79	-----	5,353,168.45
<i>Lieutenant-colonels and deputy paymasters-general.</i>						
Vinson, W.	118,535.66	1,503,000.00	88,388.88	32,996.76	\$38,380.74	1,781,302.04
Wallace, H. S.	60,355.57	6,505,000.00	749,731.64	697.16	549.42	7,316,303.79
Payson, F. L.	88,096.76	1,953,400.00	203,853.91	21,734.85	41,015.58	2,306,101.10
Downey, G. F.	-----	-----	-----	-----	-----	-----
<i>Majors and paymasters.</i>						
Goodman, T. C.	30,484.19	-----	2,037,315.35	10,367.57	56,495.63	2,134,662.74
Houston, J. B.	116,405.79	1,259,000.00	224,320.71	8,280.55	26,582.30	1,634,589.35
Ray, B. B.	-----	671,000.00	222,119.48	4,962.00	14,966.93	913,048.41
Lord, H. M.	-----	-----	-----	-----	-----	-----
Rochester, W. B., jr.	96,299.06	2,963,732.16	1,216,489.10	21,176.00	12,890.11	4,310,586.43
Smith, R. S.	85,281.35	855,000.00	541,690.92	26,985.10	34,684.27	1,543,641.64
Holloway, G. T.	82,277.27	570,000.00	1,747,053.67	29,540.14	39,536.04	2,468,407.12
Gambrell, W. G.	33,169.71	988,300.71	146,335.38	21,103.68	32,016.12	1,220,924.89
Keleher, T. D.	45,916.92	1,713,000.00	631,137.53	32,707.11	25,708.32	2,448,469.88
Pickett, G. E.	112,832.98	25,485.00	880,779.58	24,484.62	47,469.75	1,091,051.93
Canby, J.	58,942.52	1,430,100.00	91,349.48	37,980.79	40,755.33	1,659,128.12
Lynch, J. R.	107,635.73	-----	614,125.00	15,593.56	63,918.50	801,272.79
Stanton, C. E.	-----	-----	1,473,147.09	14,560.79	112,564.63	1,600,272.51
Stevens, P. C.	64,957.92	187,000.00	1,008,464.48	27,148.09	17,423.65	1,299,994.14
Dawes, J. W.	65,765.86	80,000.00	6,060.79	1,900.29	215,726.94	2,366,696.28
Slaughter, B. D.	205,394.67	1,879,000.00	193,226.99	14,743.72	14,330.90	2,306,696.28
Johnson, F. O.	-----	-----	357,917.50	11,694.36	7,439.00	377,050.86
Blauvelt, W. F.	168,268.11	1,261,625.00	210,228.88	58,554.06	28,907.81	1,727,883.86
Barroll, M. K.	-----	70,000.00	50,000.00	808.27	670.00	121,478.27
Skerrett, D.	45,007.24	120,000.00	908,804.48	19,066.27	40,123.71	1,193,001.70
Hains, J. P.	-----	-----	396,180.88	10,390.68	14,715.11	421,286.67
<i>Captains and paymasters.</i>						
Smith, E. V.	73,830.26	-----	700,016.33	17,743.62	37,296.55	828,886.76
Dwyer, C. G.	85,441.87	-----	1,037,265.23	27,859.14	37,066.74	1,187,632.98
Carnahan, F. C.	50,982.90	-----	246,351.74	9,174.46	16,208.21	322,717.31
Moody, T. M.	12,297.91	155,000.00	385,680.04	21,624.22	28,063.22	602,665.39
Lyon, H. G.	22,854.40	435,000.00	95,066.06	12,631.56	10,320.00	575,872.05
Suplee, E. M.	69,940.87	-----	463,288.87	8,500.84	41,424.58	683,155.16
Hornbrook, J. J.	-----	-----	497,561.15	21,502.93	19,597.72	638,661.80
Clark, W. F.	83,390.64	923,400.00	126,572.32	34,113.13	29,887.07	1,192,353.16
Anderson, E. D.	12,818.28	184,300.00	1,054,606.42	33,255.44	39,611.65	1,324,591.79
Miller, J. K.	24,338.51	97,000.00	709,429.97	25,642.60	25,971.49	882,382.67
Carey, E. C.	63,072.34	651,000.00	591,799.06	33,380.69	15,720.78	1,356,772.87
Castle, C. W.	-----	-----	1,047,650.00	13,186.72	58,629.00	1,119,465.72
Swezey, C. B.	48,235.48	-----	1,076,228.96	13,692.12	61,687.52	1,199,844.08
Walker, K. W.	73,690.34	488,000.00	589,526.60	37,732.99	77,201.90	1,266,151.83
Johnston, F. E.	94,481.85	-----	576,970.95	11,734.97	33,032.70	716,220.47
Hammond, H.	-----	-----	853,885.00	13,408.11	100,247.43	967,540.54
Orton, E. P.	94,960.72	1,191,000.00	120,189.40	25,530.83	76,668.32	1,388,349.27
Valentine, W. S.	30,970.25	-----	471,217.36	9,001.23	10,390.53	521,599.37
Holden, G. J.	10,554.00	932,000.00	307,014.57	23,967.23	29,722.95	1,303,258.75
Arrowsmith, G. D.	69,326.98	-----	1,262,924.50	13,875.95	74,269.01	1,420,396.44
Greenough, E. A.	44,440.41	-----	877,146.85	11,667.58	53,498.21	986,953.05
Morton, C. E.	97,760.02	60,000.00	653,997.10	23,187.92	43,818.63	878,763.67
Frith, R. E.	60,343.08	-----	843,684.72	30,028.88	54,213.82	988,270.50
Howard, C. E. N.	64,489.84	16,000.00	912,288.90	19,283.34	36,904.60	1,048,966.68
Burt, W. H.	-----	98,793.99	997,129.77	24,270.93	25,670.65	1,146,865.34
Williams, R. C.	-----	117,000.00	290,000.00	13,768.32	22,154.78	442,923.10
Wilder, W. T.	-----	140,200.00	292,412.87	7,336.62	10,105.42	450,054.81
Jarvis, M. S.	-----	-----	146,725.83	2,312.15	1,652.00	150,689.98
Dixon, H. B.	62,864.87	83,489.43	50,758.70	3,560.63	2,965.00	203,638.63
Ely, F. D.	6,165.85	-----	10,000.00	42.21	7,350.00	23,558.06
Cooke, E. H.	-----	-----	95,000.00	1,510.36	3,155.48	99,665.84

United States Army, on the 1st of July, 1908; the amount remitted to each from the United 1909; the amounts accounted for by accounts and vouchers of expenditures, or by transfer be accounted for in the next fiscal year.

Surplus funds deposited in the Treasury.	Paymaster's collections deposited in the Treasury.	Soldiers' deposits deposited.	Expenditures.	Transferred to other paymasters.	Balance in hands of each paymaster on June 30, 1909.	Total accounted for.
\$19,416.07 161,624.32	\$1,645.64 1,923.45 2,880.79	..... ..... .....	\$2,340,023.12 1,523,746.60 2,064,401.44	\$5,292,811.44 2,903,033.10 3,285,896.22	\$63,876.44 79,994.00	\$7,717,772.71 4,670,321.47 5,353,168.45
34,110.04 46,432.46 515.82	32,996.76 697.16 21,734.85	\$38,380.74 519.42 41,015.58	1,050,823.80 656,563.62 1,146,728.43	567,828.70 6,486,234.90 1,098,106.42	57,162.00 125,866.23	1,781,302.04 7,316,303.79 2,308,101.10
5,000.00 92,938.40 657.65	10,367.57 8,280.55 4,962.00	56,495.63 26,582.30 14,966.93	661,512.67 606,020.95 381,941.96	1,354,508.59 788,080.36 454,810.85	46,778.28 112,686.79 55,709.02	2,134,062.74 1,634,589.35 913,048.41
57,337.05 10,902.98 16,717.68 251.28 8,478.25 1,394.09 18,999.20 10,000.00	21,176.00 26,985.10 29,540.14 21,103.68 32,707.11 24,484.62 37,980.79 15,593.56	12,890.11 34,684.27 -39,536.04 32,016.12 25,708.32 47,469.75 40,755.33 63,918.50	1,433,800.14 999,308.35 1,258,828.44 668,442.34 1,536,117.54 888,651.96 1,338,661.36 616,372.53	2,677,940.58 408,181.39 1,043,480.52 490,111.47 802,234.78 94,722.45 169,259.49 95,388.20	107,442.55 63,579.55 80,304.30 43,223.88 34,329.06 53,471.95	4,310,586.43 1,543,641.64 2,468,407.12 1,220,924.89 2,448,469.88 1,091,051.93 1,659,128.12 801,272.79
14,560.79 27,148.09 8,060.79 116,192.38 8,332.02 37.10 9,665.36	14,560.79 27,148.09 8,060.79 14,743.72 11,694.36 58,554.06 808.27 19,066.27 10,390.68	17,423.65 1,900.29 14,330.90 7,439.00 28,807.81 670.00 40,123.71 14,715.11	851,138.82 883,258.51 124,853.72 1,063,386.30 314,125.68 1,266,623.41 52,214.68 832,435.16 268,388.34	515,521.90 287,756.54 75,655.29 1,098,042.98 253,199.59 285,162.87 72,498.61	106,486.37 84,407.35 43,791.82 111,866.97 67,785.32 16,176.59 45,628.57	1,600,272.51 1,299,994.14 215,726.94 2,306,696.28 377,050.86 1,727,383.86 121,478.27 1,193,001.70 421,286.67
..... 35.00 3,420.48 1,494.58 437.32 8,000.00 17,000.76 109.43 57.77 11,215.01 54.91 1,022.66	17,743.62 27,859.14 9,174.46 21,624.22 12,631.56 8,500.84 21,502.93 34,113.13 33,255.44 25,642.60 33,380.69 13,186.72 13,692.12 37,732.99 11,734.97 13,408.11 25,530.83 9,001.23 23,967.23 13,875.95 11,867.58 23,187.92 30,028.88 19,283.34 24,270.93 13,768.32 7,336.62 2,312.15 3,560.53 42.21 1,510.36	37,296.55 37,066.74 16,208.21 28,063.22 10,320.00 41,424.58 19,597.72 24,887.07 39,611.65 25,971.49 17,520.78 58,629.00 61,687.52 77,201.90 33,032.70 100,247.43 76,668.32 10,380.53 29,722.95 74,298.01 53,498.21 43,818.63 54,213.82 36,904.60 25,670.65 22,154.78 10,105.42 1,652.00 2,965.00 7,350.00 3,155.48	725,236.35 1,007,109.08 256,304.67 477,981.95 522,611.00 451,164.85 450,745.20 796,336.44 984,937.19 750,135.58 933,841.36 671,972.39 686,360.93 950,543.43 541,397.48 801,773.36 1,086,896.42 468,347.77 1,023,506.05 825,744.02 618,229.17 755,059.04 855,872.45 786,163.77 830,405.77 290,462.69 227,069.31 71,672.75 160,539.05 8,376.97 41,781.67	43,677.77 115,598.02 40,994.97 74,996.00 30,309.49 40,000.00 290,676.49 128,113.62 6,474.68 315,231.73 337,625.00 380,132.21 121,006.33 58,836.69 5,000.00 225,404.78 33,839.84 226,062.52 462,050.95 232,145.45 23,788.81 3,114.38 174,770.39 201,925.48 174,037.92 35,551.29 7,788.88	4,932.47 42,064.89 46,815.95 42,919.55 137,179.31 74,158.22 56,360.99 30,052.61 40,970.54 79,557.75 71,160.86 47,111.64 82,633.91 44,456.51 71,212.64 32,906.27 45,040.97 31,789.67 63,592.51 110,537.31 31,505.64 75,053.08 53,218.33	828,886.76 1,187,632.98 322,717.31 602,665.39 575,872.05 583,155.16 538,661.80 1,192,353.16 1,324,591.79 882,382.57 1,356,772.87 1,119,465.72 1,199,844.08 1,266,151.83 716,220.47 967,540.54 1,508,349.27 521,569.37 1,303,258.75 1,420,396.44 986,953.05 878,763.67 988,270.50 1,048,966.68 1,145,865.34 442,923.10 450,054.81 150,689.98 203,638.53 23,558.06 99,665.84

Statement showing the balance in the hands of each disbursing officer of the Pay Department, States Treasury, or turned over by other agents during the fiscal year ending June 30, or replacement in the Treasury, and the balance remaining in the hands of paymasters to

Rank and name.	Balance in hands of each paymaster on June 30, 1908.	Remitted from the Treasury in the year ending June 30, 1909.	Received from other paymasters.	Received from paymaster's collections.	Received from soldiers' deposits.	Total received and to be accounted for.
<i>Special disbursing agents.</i>						
Cooke, G. F.	\$75,000.00	.....	\$151,722.03	\$3,679.14	\$24,696.32	\$255,097.49
Irons, J. A.	339.95	.....	15,718.00	2.45	.....	16,060.40
Wisser, J. P.	380.61	.....	6,650.00	.....	.....	7,030.61
Hanigan, H. A.	70,000.00	.....	89,193.20	1,375.30	10,072.90	170,641.40
Landis, J. F. R.	45.25	.....	5,510.00	.....	.....	5,555.25
Guignard, W. S.	1,248.43	.....	5,000.00	.....	.....	6,248.43
Kreps, J. F.	50,000.00	.....	76,478.74	1,756.38	9,317.00	137,552.12
Cordier, C. ....	.....	.....	3,000.00	.....	.....	3,000.00
Reeves, J. H.	1,468.54	.....	5,027.78	.....	.....	6,496.32
Stokes, M. B.	7,019.73	.....	9,470.05	.....	.....	16,489.78
Jervay, W. St. J.	1,394.04	.....	5,896.88	56.59	.....	7,347.51
McCammon, E. E.	10,401.74	.....	.....	.....	.....	10,401.74
Moore, C. B.	6,306.90	.....	.....	.....	.....	6,306.90
Kobbe, F. W.	55,000.00	.....	93,185.05	456.75	20,577.40	169,219.20
Shartle, S. G. ....	.....	.....	1,458.06	.....	.....	1,458.06
Slocum, S. L'H. ....	.....	.....	5,119.92	.....	.....	5,119.92
Fergusson, F. K. ....	.....	.....	3,500.00	.....	.....	3,500.00
Murray, M. ....	.....	.....	3,500.00	.....	.....	3,500.00
Henkes, D. A. ....	.....	.....	49,131.79	40.72	460.00	49,632.51
Stewart, G. E. ....	.....	.....	41,054.42	.....	1,864.81	42,919.23
Total	3,655,882.72	\$44,309,325.58	34,558,470.35	1,012,181.65	1,861,198.53	\$5,397,058.83

United States Army, on the 1st of July, 1908: the amount remitted to each from the United 1909; the amounts accounted for by accounts and vouchers of expenditures, or by transfer be accounted for in the next fiscal year—Continued.

Surplus funds deposited in the Treasury.	Paymaster's collections deposited in the Treasury.	Soldiers' deposits deposited.	Expenditures.	Transferred to other paymasters.	Balance in hands of each paymaster on June 30, 1909.	Total accounted for.
\$59,400.00	\$3,679.14	\$24,696.32	\$105,775.73	\$8,542.29	\$53,004.01	\$255,097.49
339.95	2.45		15,334.26		383.74	16,060.40
380.61			5,991.94	658.06		7,030.61
54,600.00	1,375.30	10,072.90	47,153.28	57,439.92		170,641.40
52.79			5,502.46			5,555.25
2,043.06			4,205.37			6,248.43
36,700.00	1,756.38	9,317.00	71,515.20	3,684.45	14,579.09	137,552.12
148.08			2,851.92			3,000.00
1,650.48			4,845.84			6,496.32
1,905.65			2,846.64	11,737.49		16,489.78
	56.59		3,669.44	3,621.48		7,347.51
				10,401.74		10,401.74
				6,306.90		6,306.90
41,321.15	456.75	20,577.40	57,383.99	49,479.91		169,219.20
60.90			1,397.16			1,458.06
			5,119.92			5,119.92
			2,737.32	762.68		3,500.00
			2,275.50	1,224.50		3,500.00
	40.72	460.00	5,766.57		43,365.22	49,632.51
		1,864.81	5,536.39		35,518.03	42,919.23
805,709.59	1,012,181.65	1,861,198.53	44,236,856.96	34,558,470.35	2,862,641.75	85,397,058.83

REPORT OF THE CHIEF OF ENGINEERS, MILITARY AFFAIRS.

To avoid duplication this report is printed in Volume V.

REPORT OF THE CHIEF OF ORDNANCE.

To avoid duplication this report is printed in Volume VI.

REPORT OF THE CHIEF SIGNAL OFFICER.

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REPORT OF THE CHIEF SIGNAL OFFICER.

WAR DEPARTMENT,
OFFICE OF THE CHIEF SIGNAL OFFICER,
Washington, October 30, 1909.

SIR: In submitting the annual report of the Chief Signal Officer of the Army for the fiscal year ending June 30, 1909, the various duties will be considered under the following general heads:

- I. Signal troops for the mobile army.
- II. Telegraph and cable systems of Alaska, the Philippine Islands, and operations in the United States.
- III. Standard fire-control installations for coast defense.
- IV. Wireless telegraphy and telephony.
- V. Military aeronautics.

I. SIGNAL TROOPS FOR THE MOBILE ARMY.

Attention is invited to the following extracts from my annual report of two years ago:

Modern conditions have completely changed the military methods of operating armies and handling troops in the field. With the great range and efficiency of modern arms and the widely extended terrain now employed, it is essential to success that there shall be ample and reliable lines of information connecting the different armies and the different units of a single army in order to insure constant and accurate control of the forces involved.

It is now fully recognized by the leaders of military thought that the strength of an army is not alone measured by the number of men it contains, but by the number of rifles, guns, and sabers it can put into cooperatively effective action at any one time.

Although the late Russian-Japanese conflict furnished an example of the use of this "military weapon" in advance of anything previously attempted, yet it is believed that the development of the power of accurate control upon the field of battle through perfect lines of information makes it possible for the commander who first utilizes it to the limit for tactical purposes to gain as decisive victories in the future as any that have ever been gained in the past.

Electricity is the swift and accurate messenger which now conducts the commercial business of the world, and which is even more important in war, where the element of time is always a controlling factor.

If troops are to succeed in war, they must have field lines of information which are so reliable and certain in action as to inspire and insure the complete confidence of the mobile army which has to depend upon them. The equipment must also be so mobile as to provide instant communication by the side of the commander, wherever he may be required to go in the exercise of his duties.

TRAINED SIGNAL TROOPS ADD RIFLES TO THE FIRING LINE.

Recent field experiments with troops have conclusively proved that for every specially trained signal corps soldier provided, not only is the field information service many times increased in efficiency, but for every such soldier taken from the total strength of an army at least two men are returned to the firing line who would otherwise be removed therefrom to perform the inefficient and often impossible work of the mounted orderly of the past. Since this messenger service must be provided, either

through mounted orderlies or trained signal troops, it is manifest that the provision of a minimum per cent of the total strength for this purpose results in increasing the number of men for the firing line, instead of taking from that line. In short, it is believed that all well-informed military authorities are now in accord in advocating the development of this branch of the service to the limit of its possible usefulness.

These troops must be trained with the troops of the line, for which they primarily exist, and the establishment of larger maneuver posts in the United States creates an immediate demand for such organized bodies of signal troops. That this demand has been already recognized is evidenced by the recent official requests for battalions of signal troops to be provided for at three of the larger maneuver posts. Plans and specifications have been forwarded for the necessary barracks, vehicle sheds, stables, etc., for these posts, in advance of any provision at present for a personnel to meet these demands.

In my annual report of last year occurs the following:

The present strength of the Signal Corps of the Army has made it impossible to make any adequate provision for the indispensable service of lines of information for the mobile army. In the last annual report the urgent necessities of the case were reported to the War Department, and, with the approval of the Secretary of War, the Lieutenant-General of the Army, and the Chief of Staff, proposed legislation to increase the efficiency of the Signal Corps was formulated and is now before Congress for its consideration.

* * * * *

Until Congress takes some action to increase the number of officers and men of the Signal Corps, the mobile army of the United States must remain vitally weak in a service where it should be strongest.

The extended terrain at present involved in military operations, and the great range at which modern weapons kill, makes the supreme commander of an army in the field practically helpless in controlling the units of his force without the most perfect lines of information connecting him with the different units of his army and following him and them at all times during active military operations in campaign.

The existing three combatant arms of the service, namely, infantry, cavalry, and artillery, are fundamentally designed to act cooperatively with one another to produce the maximum result in combat. It is evident that with the great terrain involved in a modern battle and the large number of troops engaged, the whole cooperative plan of the three combatant arms must surely fail without the presence of highly trained signal troops, which places in the hands of the supreme commander the only known means at present of securing accurate command of his army from hour to hour.

Military lines of information not only serve as a means of obtaining the information upon which the movements are based, but, which is of equal importance, furnish the only means of actually utilizing this information in controlling and operating the units of an army as one gigantic whole.

Since the above was written conditions have become more and more acute, and have reached a point where it can be stated without hesitation that practically every general officer of the army commanding troops is on record as to the pressing needs of adequate organized signal troops for service with the line of the army, and has stated that in the event of war the greatest need of the American Army is an adequate force of trained signal troops.

There have at present been organized four field companies, and this is the maximum number that can possibly be allowed for the mobile army with the present strength of the Signal Corps. These companies are stationed as follows: Company A, on duty under the commandant, Army Service Schools, Fort Leavenworth, Kans.; Company D, Fort Omaha, Nebr.; Company E, Presidio of San Francisco, Cal.; and Company I, Fort Sam Houston, Tex.

There is not a single company of signal troops east of the Mississippi River. Constant requests to the War Department for signal troops for service with the mobile army are referred to this office, but can not be met. On September 2, 1909, the commanding general, Philippines Division, cabled the War Department requesting that a mounted company of signal troops be sent immediately to

the Philippines Division, and a similar request from the commanding general, Department of the East, for a company of signal troops to serve in the maneuvers of the organized militia near Boston in August of the current year could not be granted.

Proposed legislation for increasing the efficiency of the Signal Corps of the Army, which received the approval of the Secretary of War, the Lieutenant-General of the Army, the Chief of Staff of the Army, and the commandant of the Army Service Schools, was introduced in the second session of the Sixtieth Congress. On January 26, 1909, the Committee on Military Affairs of the House of Representatives submitted to the House the bill as amended by said committee with the following remarks:

The committee also submits some extracts from reports from the chief umpire on summer maneuvers of 1908, and *believes that no more important legislation for the effective organization of the army can possibly be enacted than this increase of the Signal Corps.*

It is again recommended that the Congress give this matter favorable consideration.

II. TELEGRAPH AND CABLE SYSTEMS OF ALASKA, THE PHILIPPINE ISLANDS, AND OPERATIONS IN THE UNITED STATES.

ALASKA.

The Washington-Alaska military cable and telegraph system was satisfactorily maintained and operated through the year, except for a few interruptions due to storms, landslides, and forest fires. The latter have always been prevalent in summer along the Yukon River west of Fort Gibbon, but are yearly becoming less destructive with the passing of the forests.

The system at this date comprises 2,592.35 miles of submarine cable, 204 miles of double and 1,159 miles of single land line, and 854 miles of wireless. During the year new cables were laid from the junction of the Valdez-Seward cable on Montague Island to Cordova, in order to connect with the system this rapidly growing town situated at the southern terminus of the Copper River and Northwestern Railway, and from Cordova to the naval wireless station at Point Whithshed.

A cable tank capable of holding 150 miles of deep-sea cable has been provided. It is located at Tacoma, Wash., and was placed in service June 15, 1909.

ADMINISTRATION.

The system has, as heretofore, been under the immediate direction of the chief signal officer, Department of the Columbia, at Seattle, Wash.

In order to increase the efficiency of administration of the land lines and to permit more frequent inspections of the various interior stations, especially the wireless plants, the number of signal officers on duty in Alaska has been increased during the present summer from three to four. The system will still be divided into four sections, though the scope of each has been somewhat changed to meet new conditions. The lines from Valdez to Fort Egbert and to Paxson comprise the first section and are supervised by the signal officer at Valdez. Those from Paxson to Glen and from Fort Egbert to

Boundary, together with the wireless stations at Fairbanks, Circle, and Fort Egbert, comprise the second section and are supervised by the signal officer at Fairbanks; those from Glen to Kaltag and the wireless station at Fort Gibbon comprise the third section and are supervised by the signal officer at Fort Gibbon; those west of Kaltag and the wireless stations at St. Michael and Nome comprise the fourth section and are supervised by the officer in charge at St. Michael.

Below is given a list of stations and distances corrected to date.

STATIONS AND DISTANCES.

		Inter- mediate.	Total.			Inter- mediate.	Total.
LAND LINES.				CABLES.			
<i>St. Michael-Valdez.</i>				<i>Seattle-Seward.</i>			
	<i>Miles.</i>	<i>Miles.</i>			<i>Miles.</i>	<i>Miles.</i>	
St. Michael.....	0	0		Seattle.....	0	0	
Golsova.....	35	35		Sitka.....	1,085	1,085	
Unalakleet.....	30	65		Valdez.....	599	1,684	
Old Woman.....	50	115		Fort Lisicum.....	4	1,688	
Kaltag.....	45	160		Seward.....	189	1,877	
Nulato.....	40	200		Montague Island - Cordova			
Koyukuk.....	30	230		Cape Whitted.....	68	1,945	
Louden.....	50	280					
Melozl.....	35	315		<i>Sitka-Skagway.</i>			
Kokrines.....	38	353		Sitka.....	0	1,945	
Birches.....	40	393		Cape Fanshaw (no station)...	211	2,156	
Fort Gibbon.....	55	448		Juneau.....	98	2,254	
Rapids.....	24	472		Haines Mission.....	106	2,360	
Rampart.....	23	495		Skagway.....	18	2,378	
Glen.....	35	530					
Hot Springs.....	21	551		<i>Cape Fanshaw-Ketchikan.</i>			
Tolovana.....	37	588		Cape Fanshaw (no station)...	0	2,378	
Minto.....	39	627		Wrangell.....	63	2,441	
Nenana.....	35	662		Hadley.....	69	2,510	
Chena.....	29	691		Ketchikan.....	28	2,538	
Fairbanks.....	10	701					
Salcha.....	37	738		<i>Lawton-Worden.</i>			
Delta.....	29	767		Fort Lawton.....	0	2,538	
Richardson.....	2	769		Fort Worden.....	42	2,580	
McCarty.....	20	789					
Donnelly.....	36	825		<i>Ward-Lawton.</i>			
McCallum.....	37	862		Fort Ward.....	0	2,580	
Paxson.....	18	880		Fort Lawton.....	12	2,592	
Hogan.....	30	910					
Gulkana.....	30	940		<i>Sitka-Japonski Island.</i>			
Copper Center.....	25	965		Sitka.....	0	2,592	
Tonsina.....	25	990		Japonski Island.....	.35	2,592.35	
Teikhell.....	24	1,014					
Saina.....	24	1,038		<i>Wireless.</i>			
Wortmans.....	12	1,050		Egbert-Circle.....		107	
Valdez.....	18	1,068		Circle-Fairbanks.....		130	
				Fairbanks-Gibbon.....		130	
<i>Nome-Fort Davis.</i>				Gibbon-Nome.....		330	
Nome.....	0	1,068		Nome-St. Michael.....		127	
Fort Davis.....	4	1,072		Petersburg-Wrangell.....		30	
<i>Gulkana-Fort Egbert.</i>				Total.....		854	
Gulkana.....	0	1,072					
Chitochina.....	40	1,112					
Mentasta.....	46	1,158					
Tanana Crossing.....	51	1,209					
Ketohumtoek.....	55	1,264					
Fort Egbert.....	87	1,351					
Boundary (no station).....	12	1,363					

RECAPITULATION.

Land lines (double wire).....	204
Land lines (single wire).....	1,159
Wireless.....	854
Cables.....	2,592.35
	4,809.35

During the year new telegraph offices were established at Circle and Cordova and money-transfer offices opened at Cordova and Hot Springs.

The line receipts amounted to \$206,078.68 "this line;" \$16,809.72 "other lines," and government business was handled to the value of \$188,782.68. There was no case of loss of line receipts during the year.

The Signal Corps money transfer system continues to be of great value to the commercial interests of Alaska. During the year a total of \$72,133.18 was transferred by telegraph, an increase of \$16,120.58 over the previous year. Tolls accruing from this service amounted to \$763. No loss has occurred in this business since its establishment eight years ago.

EXTENSIONS AND BETTERMENTS.

Cables.—Changes, repairs, additions, etc., to the cable system are described under the heading "Cable ships," work of the *Burnside*, page 15.

Land lines.—At the beginning of the calendar year 1908, the constantly increasing telegraph business over the land lines between Fairbanks and Valdez, due to the development of commercial interests in interior Alaska, demonstrated the necessity for a second wire between these points. Work on the section between Valdez and Gulkana was commenced April 25, 1908, and the new line completed on September 9, 1908.

In the month of December working parties commenced operations from both Fairbanks and Gulkana, and at the close of the fiscal year about 100 miles of this section was completed. Considering the poor transportation facilities of Alaska and the many difficulties attending line construction which are not experienced in similar work in the United States, the progress made is considered more than satisfactory. It is expected that the Gulkana-Fairbanks section will be completed by September 1, 1909. Upon the completion of this second wire between Fairbanks and Valdez, together with the improved wireless equipment at Fairbanks, Circle, and Fort Egbert, it is believed that communication will be made so reliable that the abandonment of the expensive and unimportant land line between Fort Egbert and Gulkana can soon be effected.

Wireless.—In carrying out the plans described in my last annual report to perfect the wireless system in Alaska, the following installations have been made: At Nome and Fort Gibbon, 10-kilowatt stations; at Fairbanks, Fort Egbert, and Circle, 3-kilowatt stations; and at Wrangell and Petersburg, 1-kilowatt stations. In addition, a 1-kilowatt station will be installed at Kotlik, near the mouth of the Yukon River. The installations at Nome, Fort Gibbon, Fairbanks, Fort Egbert, and Circle were commenced about July 1, 1908, and the stations completed by the close of the summer. At each station comfortable, modern buildings have been erected for use as wireless offices and as quarters for the enlisted personnel operating the station. Steel towers 200 feet in height shipped from the United States were assembled at the various stations and erected to support the antennæ. Considering the difficulties of transportation in the interior of Alaska and the remoteness of the stations from markets where even the simplest of electrical supplies can be

purchased, wireless operations during the past year are considered more than satisfactory. No attempt has been made to supplant the military telegraph lines by the use of wireless methods, but rather to provide auxiliary means of communication to relieve congestion on certain lines and to insure communication at such times as the main lines are interrupted by storms and forest fires which are common to Alaska.

Through the year reserve transformers for all stations in Alaska have been purchased and shipped, the new equipment for Fairbanks, Fort Egbert, and Circle being designed to change the plants from 3 to 5 kilowatt stations. Consideration is now being given to the matter of establishing communication between the naval station at Cordova and the inland stations of the Signal Corps by the installation of a station at Gulkana or some other intermediate point, thus rendering through communication independent of the land lines. With the above-mentioned installations completed, it is considered that the means of communication from interior Alaska to the coast are adequate for the present needs of the country.

DETAIL STATEMENT OF EXPENDITURES UNDER ARMY APPROPRIATION ACT APPROVED
MARCH 2, 1907.

Balance of appropriation remaining unexpended.....	\$34, 868. 39
Expended, extensions and betterments to Alaskan cable system.....	34, 868. 39

DETAIL STATEMENT OF EXPENDITURES UNDER ARMY APPROPRIATION ACT APPROVED
MAY 11, 1908.

Appropriation.....	\$202, 500. 00
1. For all wireless telegraph installations.....	\$83, 292. 90
2. Rebuilding and betterments to the military telegraph line between Nome and Paxson.....	11, 177. 23
3. Rebuilding and betterments to the military telegraph lines between Valdez and Paxson, Gulkana, and Fort Egbert.	10, 841. 96
4. Extensions and betterments to the Alaskan cable system.	94, 687. 91
5. Reimbursements to officers for traveling expenses in excess of mileage allowed by law.....	495. 62
Total expenditures.....	200, 495. 62
Unexpended balance.....	2, 004. 38

The army appropriation act approved March 3, 1909, provides that of the receipts of the Washington-Alaska military cable and telegraph system that have been covered into the Treasury of the United States the sum of \$100,000 is appropriated and made available for defraying the cost of such extensions and betterments of the system as may be approved by the Secretary of War.

TELEGRAPH RESERVATIONS.

During the last fiscal year there have been reserved and set apart for the use of the Signal Corps in the operation and maintenance of the United States military telegraph and cable lines in Alaska the following:

By executive order dated July 25, 1908, the following-described tract of public land at Tanana, adjoining the military reservation of Fort Gibbon, was reserved:

Beginning at corner No. 1, marked by an iron-pipe monument about 3 feet high and about 3 inches in diameter, being centered with a tack by means of a wooden plug, and placed at the intersection of the east line of the Fort Gibbon, Alaska, Military

Reservation and the north line of S. A. Homestead Claim of the North American Transportation and Trading Company, said point of intersection being approximately 668 feet due north of the monument at the southeast corner of the said Fort Gibbon, Alaska, Military Reservation; thence S. $83^{\circ} 30'$ E. 800 feet, following the north boundary line of the said homestead, to corner No. 2, marked by a monument of the same description as said monument at corner No. 1; thence due north 1,000 feet to corner No. 3, marked by a monument of the same description as said monument at corner No. 1; thence N. $83^{\circ} 30'$ W. 800 feet to corner No. 4, marked by a monument of the same description as said monument at corner No. 1, and situated on the east line of the said Fort Gibbon, Alaska, Military Reservation; thence due south 1,000 feet, following the east boundary line of the said Fort Gibbon, Alaska, Military Reservation, to corner No. 1, the place of beginning; containing an area of 18.25 acres, more or less. All courses are referred to the true meridian.

The said premises include a part of the homestead entry of Arthur J. Campbell; which entry has been relinquished as to so much of the land as is covered by this order, by deed of the said Arthur J. Campbell, dated March 23, 1908, and recorded March 30, 1908, in volume 2 of deeds, page 250, Rampart recording district, Alaska. (G. O., 126, W. D., 1908.)

The following-described tract at Circle, Alaska, was reserved for a wireless telegraph station by executive order of September 30, 1908:

That tract of public land included within metes and bounds (except the tracts "A" and "B," as hereinafter described), as follows:

Beginning at a stake 42 feet north of the northern corner of the northeast concrete pier of tower; thence east 130 feet to a stake, corner 1; thence south 126 feet to a stake, corner 2; thence west 250 feet to a stake, corner 3; thence north 126 feet to a stake, corner 4; thence east 120 feet to the place of beginning, containing, less the exceptions stated, 0.71 acre. The courses are magnetic.

Excepted tracts:

"A"—A rectangular tract 14 feet north and south by 23 feet east and west, the northwest corner of which is situate 29 feet west and 24 feet south of the point of beginning.

"B"—A rectangular tract 18 feet north and south by 15 feet east and west, the northwest corner of which is situate 55 feet west and 45 feet north of the southeast corner of the reservation. (G. O., 158, W. D., 1908.)

A tract of land on Montague Island was reserved by executive order of October 26, 1908, which reads as follows:

It is hereby ordered that the northern part of Montague Point, Montague Island, Prince William Sound, Alaska, on which the United States cables are now landed, embracing all public lands included within metes and bounds as follows, be reserved from sale or other disposition, subject to private rights, if any there be, and set apart for the use of the Signal Corps, United States Army, in the operation of military telegraph lines in Alaska, viz:

Beginning, for the northwest corner, at a small stone monument at high-water mark (latitude $60^{\circ} 22' 25''$ north; longitude $147^{\circ} 08' 00''$ west), the position of which is determined by left tangent of Seal Island bearing S. 81° W.; and right tangent of Knowles Head bearing N. 12° E.; thence S. 28° E. 880 yards, to the southwest corner (latitude $60^{\circ} 22' 00''$ north; longitude $147^{\circ} 08' 00''$ west); thence N. 62° E. 2,640 yards, to the southeast corner (latitude $60^{\circ} 22' 00''$ north; longitude $147^{\circ} 05' 30''$ west), the position of which is determined by right tangent of Knowles Head bearing N. 9° E.; thence following the coast line, which bounds the reservation to the northward and eastward, to the point of beginning. All bearings are magnetic. (G. O., 176, W. D., 1908.)

By executive order of November 24, 1908, the following-described tract of land at Gulkana was reserved:

Beginning at the corner post marked "U.S.M.R.No. 1," at the west end of the extreme south boundary of the reservation, which post bears S. 55° W. 144.43 feet from the west end of south wall of Gulkana telegraph station; thence N. 49° E. 1,000 feet to post marked "U.S.M.R.No. 2;" thence S. 41° E. 1,000 feet to post marked "U.S.M.R.No. 3;" thence S. 49° W. 1,000 feet to post marked "U.S.M.R.No. 4;" thence N. 41° W. 1,000 feet to point of beginning. The bearings given are referred to the true meridian. Magnetic declination, 1908, 30° east. (G. O., 200, W. D., 1908.)

The following is a copy of executive order of February 27, 1909, making a reservation at Nome:

On the recommendation of the Secretary of the Interior, concurred in by the War Department, I hereby withdraw from all forms of disposal and reserve, for use of the Signal Corps, U. S. Army, as a wireless telegraph station in connection with the operation and maintenance of telegraph lines in Alaska, those certain blocks numbered eighty-eight (88), eighty-nine (89), and one hundred twenty-two (122), situated in the city of Nome, Alaska, and exhibited upon the plat of the Nome town site approved April 13, 1905. (G. O., 55, W. D., 1909.)

On June 15, 1909, the following executive order was issued, reserving a tract at Rampart:

It is hereby ordered that lots 6, 7, and 8, of block 5, of the town of Rampart, Alaska (each lot being 50 feet wide by 100 feet in depth), as shown on plat of survey of Messrs. Boscaren and Crawford, and upon which lots certain military buildings were erected in the winter of 1898, be, and the same are hereby, reserved and set apart for military purposes in connection with the operation and maintenance of military telegraph service in Alaska. (G. O., 123, W. D., 1909.)

The army appropriation act approved March 3, 1909, contains the following provision:

Provided, That the conveyance by George C. Hazelet, trustee, of a tract of about two acres of land in the town of Cordova, on Orca Inlet, Alaska, which it is proposed to donate to the United States as the site for a cable station be, and the same is hereby, accepted.

The reservations previously set apart are described in the reports of the Chief Signal Officer of the Army for 1906, 1907, and 1908.

CONDITION OF ENLISTED MEN.

The men of the Signal Corps, assisted by men from the line of the army, have cheerfully and faithfully performed their duties in the operation of the lines and the maintenance of communication throughout the year. A noticeable improvement is apparent in the zeal and efficiency of all the station men, particularly among the men detailed from the line for duty as repair men. This is believed to be directly traceable to the allowance of extra pay now authorized for all men serving on the telegraph lines, and is an eminently just reward for men engaged in this service. The health of the enlisted men in Alaska has been excellent. Two accidental deaths occurred during the year, due to the severity of the climate.

PHILIPPINE ISLANDS.

The operation of the military telegraph lines, cables, and wireless stations in the Philippine Islands has been under the immediate supervision of the chief signal officer, Philippines Division.

TELEGRAPH AND CABLE SYSTEM.

The military telegraph system operated during the year comprises 34 miles of line and 14 offices. The lines are as follows: Manila to Fort William McKinley, Laoang to Tagabiran, Iloilo to Camp Jossman, and Camp Stotsenburg to Angeles.

At the request of the chief quartermaster of the division, and with the approval of the divisional commander, a cable was laid by the cable ship *Liscum* on February 26, 1909, between Legaspi, Albay, and

Liguan, Batan Island, a distance of 14.539 statute miles. The purpose of this cable is to afford telegraphic communication for the government coal mines which are being developed by the quartermaster's department on Batan Island.

In addition to the foregoing, the Signal Corps maintains two cables in Subig Bay, one from Grande Island to Olongapo and the other from Grande Island to Macmanys Point; combined length, 9.6 statute miles. Offices are conducted at Liguan and Fort Wint.

The *Liscum* was engaged during the year seventy-eight days and twenty-two hours in the repair and inspection of insular government cable.

Pending the establishment of cable communication between Corregidor and Carabao islands visual signaling stations at those points have been maintained since September, 1908. The cable for this service will be laid in the coming year.

TELEPHONE SYSTEMS.

The following telephone systems were reconstructed during the year: Camp Eldridge, Camp Keithley, Camp McGrath, Malabang, Camp Jossman, Camp Wallace, Camp Wilhelm, Camp Stotsenburg, Fort William McKinley. Temporary systems were installed at Fort Mills and Fort Wint. Complete new instrumental equipments of telephones were issued for installation at Iloilo, Camp Jossman, Camp Keithley, post of Jolo, Parang, Malabang, and Camp Overton. The military telephone system at Iloilo was entirely rebuilt. The post telephone systems in the Department of the Visayas, with the exception of Camp Jossman and the system in the city of Iloilo, are to be rehabilitated during the coming year.

The military telephone system in the city of Manila was dismantled under authority of the division commander dated June 18, 1908, with the exception of a 10-drop switchboard in the orderly room at Cuartel de Infanteria. This board furnishes connection with Fort William McKinley, division headquarters at Fort Santiago, headquarters Department of Luzon at Estado Mayor, the signal corps wireless station in Manila, signal corps machine shops, corral, office of Company F, Signal Corps, and the city commercial lines.

Telephone systems were in operation at Camps Bumpus, Connell, Daraga, Downes, Eldridge, Gregg, John Hay, Jossman, Keithley, McGrath, Overton, Stotsenburg, Vicars, Wallace, and Wilhelm, Fort William McKinley, Iloilo, Jolo, Malabang, Manila, Parang, Warwick Barracks, and Zamboanga, with 403 telephones and comprising 384.5 miles of line. Long-distance telephone lines were operated between Cotabato and Fort Pikit, Malabang and Camp Vicars, Camp Keithley and Camp Overton, and Abuyog and Dulag, a total mileage of 104.

WIRELESS TELEGRAPHY.

Plans have been prepared and the equipment assembled for a 3-kilowatt station at Malabang, Mindanao, for the Philippine insular government, and for a 10-kilowatt station for Corregidor Island, Manila Bay.

The signal corps wireless station at Jolo was transferred to the insular government on January 31, 1909, and the Zamboanga station

on May 13, 1909. The property transferred to the insular government from these two stations represents a value of \$11,642.87.

ENLISTED MEN.

The enlisted strength of the corps in the Philippines at the end of the fiscal year aggregated 138 men. Twenty men have been discharged in the islands, 13 by expiration of term of service, 5 to accept service with the bureau of posts, 1 by order without honor, and 1 dishonorably, per general court-martial. Eight men reenlisted in the corps, 11 were obtained by transfer from the line, and 50 by transfer from the United States.

Forty-five men were returned to the United States during the year—23 for duty, 9 for medical treatment, and 13 for discharge. Of the 139 men who were present at the end of the fiscal year 1908, 92 remain at the end of the fiscal year 1909.

There were only 2 men present who have had two years' continuous service in the islands, but these men have not completed two years' service with the Signal Corps there.

UNITED STATES.

The operations of the Signal Corps in the United States during the past fiscal year cover the management of the military telegraph lines, the establishment of post telephone systems, the supplying of signal equipment to the army and the organized militia, the installation of fire-control systems for coast defenses, military aeronautics, the provision of fire-control and fire-direction systems for field artillery, enlisting and training of recruits in visual, electrical, and telephone work, electrical and other experimental work, and active and suitable preparations with a view to placing the corps in a state of efficiency and preparedness for war or other emergency.

SIGNAL CORPS POSTS.

During the year the posts at Fort Omaha, Nebr., and Fort Wood, N. Y., were garrisoned exclusively by the Signal Corps. The garrison at Fort Omaha consists of Companies B, D, and H, while the post at Fort Wood is garrisoned by Company G, Signal Corps. At both these posts are maintained schools for the instruction and training of the enlisted men of the Signal Corps. Both posts are equipped with 3-kilowatt wireless sets. At the Fort Wood post, a special class has been conducted during the year for the instruction of enlisted men in wireless telegraphy, and trained operators from this post have been sent out to take charge of various wireless stations on army transports and in Alaska.

GENERAL DEPOTS OF SUPPLY.

The Signal Corps has three general depots of supply. They are located at Fort Wood, New York Harbor; Fort Omaha, Nebr.; and Fort Mason, Cal. In addition to the signal-service stock kept at all three depots, an extensive stock of fire-control supplies and equipment is kept at Fort Wood and Fort Mason. During the year the stock at the Fort Mason depot has been increased, due to the activity of fire-control work in the insular possessions.

A daily card record of receipts and issues is kept at each depot and a record of all changes forwarded daily to the Chief Signal Officer of the Army.

THE ARMY SIGNAL SCHOOL.

The work of the Army Signal School for the past year has been satisfactory in every respect. The Signal School was established in 1905, and during the short time of its existence it has demonstrated its usefulness to the Signal Corps and the line of the army in a way which leaves no doubt in the minds of all having knowledge of its history.

The equipment of the school has been improved year by year until it may now be considered as well adapted for the purposes of the school in every respect. General Orders, No. 133, War Department, July 1, 1909, prescribe the regulations governing the Army Signal School. The objects of this school as stated in that order are as follows: To prepare officers of the Signal Corps for the better performance of the active duties of their profession, to provide instruction in signal duties for such officers of the line as may be designated therefor, and to make research and practical experiments in such subjects as relate to the duties of the Signal Corps.

The course of study is embraced in four departments, namely: The department of field signaling, the department of signal engineering, the department of topography, and the department of languages.

Company A, Signal Corps, is assigned to special duty under command of the commandant of the army service schools and is used exclusively for furnishing military lines of information of all kinds required in terrain exercises, maneuvers, and staff or tactical rides, to the end that the student officers of all these institutions may obtain the maximum benefit from the exercises prescribed.

FIRE-CONTROL EQUIPMENT FOR FIELD ARTILLERY.

The Signal Corps has endeavored to improve the efficiency of the electrical signaling equipment for the fire-control system of the field artillery which is prescribed in General Orders, No. 150, War Department, 1909. The increasing use of indirect fire and the necessity for complete control over fire and direction when several batteries are operating under the command of one officer has rendered the equipment issued by the Signal Corps of considerable importance.

Based on the recommendations of the field artillery board at Fort Riley, Kans., the Signal Corps has commenced the issue of cavalry buzzers instead of telephones and has purchased a supply of special twin-conductor cable for issue in lieu of the field wire formerly supplied to battalion and regimental headquarters. A new type of field artillery telephone has been devised at the Army Signal School. A few of these telephones have been made and sent to the field artillery board at Fort Riley for experiment and trial.

CABLE SHIPS.

The cable ship *Burnside* was actively engaged in the maintenance of the Alaskan cable system and the installation and repair of fire-control cables in Puget Sound. In Alaskan waters during August,

1908, she laid the Cordova-Montague cable, wired and equipped the new office at Cordova, and wired the Valdez office for duplex telegraphy. In September she cooperated with the navy in the selection of a site for the naval wireless station at Point Whited and laid the cable connecting that point with Cordova. During June, 1909, she repaired the Ketchikan, Sitka-Valdez, and the Sitka-Japonski cables. In Puget Sound in January, February, March, and April she was engaged in the repair of Sitka-Seattle, Fort Ward-Fort Lawton, and Fort Lawton-Fort Flagler cables, the recovery of the Fort Casey-Fort Flagler cable, and the installation of the Fort Worden-Fort Flagler and the Fort Worden-Fort Casey cables.

A new cable ship, the *Joseph Henry*, was put in commission in connection with the installation and maintenance of fire-control cables. The *Joseph Henry* is a ship of 610 gross tonnage, 165 feet in length, with a 32-foot beam. The ship has been assigned to station at New York for the repair of all fire-control cables on the Atlantic seaboard south of the seacoast artillery district of Boston.

The cable ship *Cyrus W. Field* has been actively engaged in the maintenance of fire-control cables along the Atlantic coast. Since the *Joseph Henry* was put in commission, the *Cyrus W. Field* has been assigned to Boston for station and charged with the care and maintenance of all fire-control cables in the artillery districts of Boston, Portland, and Portsmouth.

SIGNAL CORPS OF THE ORGANIZED MILITIA.

Signal troops form a part of the organized militia in the following States: California, Colorado, Connecticut, Illinois, Indiana, Kansas, Kentucky, Louisiana, Michigan, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New York, Ohio, Oklahoma, Rhode Island, Vermont, Texas, Utah, Washington, the District of Columbia, and the Hawaiian Islands. These militia organizations are quite generally composed of professional men of technical ability. They are, however, not uniformly organized and equipped.

The rapid development in the duties and usefulness of signal troops in the past few years has made the subject of company organization important, and renders it imperative for signal organizations to specialize in their work and equipment. It is no longer possible for a detachment of signal troops to take the field prepared to perform all of the classes of work devolving on the Signal Corps.

In the event of war with a first-class power, the field companies of signal troops for the first line of national defense would necessarily be limited to those of the Regular Army and the national guard. The work of field companies of signal troops requires a close company organization, prescribed equipment, and team work which can only be achieved by constant practice and drill.

On the outbreak of war thousands of skilled telegraphers and electricians would be available for service, and they could be quickly and efficiently formed into the base line companies of the signal troops, which are to provide the strategical lines of information behind the armies in the field. But men can not be hastily formed into field companies which are to provide the lines of information for the

tactical operations at the front, due to the fact that the work of field companies requires much previous practice and team work.

In order to provide these field companies on the outbreak of war, the organized militia must, in time of peace, organize and equip their signal organizations as field companies.

WIRELESS-TELEGRAPH WORK.

The wireless operations of the Signal Corps during the past year have exceeded those of all previous years.

The army transports now equipped with wireless sets are the *Sheridan*, *Sherman*, *Thomas*, *Kilpatrick*, *Logan*, and *Burnside*. Arrangements have been made with the general superintendent of the army transport service for the accommodation of two wireless operators on each transport; additional operators have been detailed to the transports *Sheridan*, *Thomas*, and *Logan*. The results obtained from this arrangement have, in general, been entirely satisfactory. Probably the best record for work on the transports was made by the *Sheridan* on her round trip from San Francisco February 5, 1909, to April 14, 1909. The following is an extract from the report of the quartermaster of the *Sheridan*:

On February 5 the *Sheridan* sailed from San Francisco, and we were in communication daily until reaching the one hundred and eightieth meridian. On February 17 we communicated with Tatoosh light, a distance of 3,000 miles.

Sailed from Manila March 14, and messages were exchanged daily until Nagasaki was reached, March 20.

March 22 sailed from Nagasaki and were in communication with Japan every day until arrival at Midway March 31, a distance of 2,800 miles, when Honolulu was picked up.

From Midway to arrival at Honolulu, April 6, messages were exchanged with Honolulu.

From Honolulu, San Francisco was heard daily until arrival, April 14, 1909. Honolulu was held for about 1,200 miles.

During the voyage the steamship *Minnesota* was communicated with at a distance of 1,400 miles; the *Nippon Maru* at 1,200 miles; the *Thomas* approximately 650 miles; Sitka, Alaska, 1,600 miles; Los Angeles and practically every city equipped with wireless on the Pacific coast was heard from.

In connection with fire-control installations, the artillery district signal stations at Forts Totten, Hancock, and Worden have been provided with 1-kilowatt sets. The stations at Forts Levett, Andrews, H. G. Wright, and Monroe are being equipped with sets of similar capacity. Like stations, for which funds are now available, are projected for Forts Stevens, Winfield Scott, and Wint. A 10-kilowatt set is being provided for Fort Mills, the military importance of this station and its strategic location rendering it advisable to furnish equipment with a wide range of operation. As an adjunct to the wireless-telegraph equipment installed in the district signal stations, $\frac{1}{4}$ -kilowatt tug sets have been furnished for Fort Monroe and Fort Hancock, the remaining districts being equipped with sets of the type supplied for field use. The type to be eventually adopted as standard will depend upon the operation of the sets which are now being furnished.

The wireless-telegraph work in Alaska is described on page 233, and that in the Philippine Islands on page 237.

SIGNAL TROOPS IN MANEUVERS.

During the year great advances and improvements were made in the development of the use of field lines of information in connection with the various troops at maneuvers. To meet the demands at the various maneuver camps; two field companies (D and E) were hastily organized, and with Company A, already organized, served in connection with the maneuvers at the camps specified:

Company A: William H. Taft, Chickamauga Park, Ga.; Emmet Crawford, Dale Creek, Wyo.; Fort Riley, Kans.

Company D: Leon Springs Reservation, Tex.; Fort Benjamin Harrison, Ind.

Company E: Atascadero, Cal.

Concerning the operations of these companies the following extracts from official reports are quoted:

It affords me pleasure to commend the work of the Signal Corps and its officers. It was a revelation to us all and emphasizes the fact that one or more companies should always be present whenever any considerable body of troops, regular or militia, is assembled for instruction and maneuvers. With two companies present, it would be possible to serve both the forces in the field and the umpires in control of maneuvers. With but a single company available this can not be done, and opposing forces have to fall back upon mounted staff officers and orderlies as a means of communication, in order that the chief umpire and his assistants may properly control and direct a maneuver with two or more thousand men to a side. One company was barely sufficient for this purpose. (Extract from official report of the commanding general, Camp William H. Taft, Chickamauga Park, Ga.)

The work of the Signal Corps in the tactical problems was of a high order, and emphasized the disappointment I felt at not having them present in the camp from the first. (Extract from the official report of the commanding general, maneuver camp, Fort Riley, Kans., 1908.)

The absence of the signal corps company during the first part of the instruction was very disappointing, not only as regards the work of the Regulars, but as handicapping the instruction of the organized Militia of Kansas, whose signal detachment arrived without signal apparatus and found none in camp for their instruction, except what could be improvised for flag signaling. After the company did come its work was of a very high order. (Extract from the official report of the chief umpire, maneuver camp, Fort Riley, Kans., 1908.)

The detachments of the state signal corps were attached to the regular signal corps company. * * * The efficient and rapid work of establishing lines of communication with the new reel carts was a decided advance over the old system and attracted general and favorable comment. (Extract from the official report of the commanding general, maneuver camp, Fort Benjamin Harrison, Ind., 1908.)

The signal corps work could not have been better; the commander was kept in constant communication with all parts of his outpost, day and night. (Extract from the official report of the chief umpire, maneuver camp, Leon Springs, Tex., 1908.)

It is regretted that the personnel of the Signal Corps prevented the detail of a company of the Signal Corps to the maneuver camp at Pine Camp, Jefferson County, N. Y. In this connection the following extract is quoted from the official report of the commanding general of that camp:

A regrettable fact was that it was impossible to have a company at least of the United States Signal Corps on duty at Pine Camp with the other troops, as the services of these technical troops were greatly needed in the maneuvers. The services of the signal corps troops were not only needed, but the absence of these troops prevented several militia signal corps companies from coming to Pine Camp. These militia companies of the signal corps consequently lost the valuable instruction in field work which they would have received if they had been in camp.

MILITARY TELEGRAPH LINES IN THE UNITED STATES.

The following lines have been operated: From Huachuca, Ariz., to Lewis Springs, Ariz.; from Fort Bayard, N. Mex., to Bayard, N. Mex.; from Holbrook, Ariz., to Fort Apache, Ariz.; from Fort Myer, Va., to Fort Washington, Md.; from Fort Clark, Tex., to Spofford Junction, Tex. No lines have been discontinued since my last report.

Tariffs amounting to \$1,184.63 were collected for the transmission of commercial telegrams over military lines in the United States. This amount has been deposited in the Treasury of the United States, as required by law. In addition thereto, there has been collected and transferred to commercial companies the sum of \$7,710.31, covering tariffs for messages transmitted by such companies over their lines. A total of 98,612 messages was handled. This does not include the messages over the Washington-Alaska system, transferred to and from commercial companies at Seattle.

In addition to the lines mentioned, 59 military posts in the United States are connected by short branches or loops to commercial telegraph lines. These short lines are operated by enlisted men of the army. The offices collect no "this line" tolls, and therefore do not render line receipts. Short lines or loops have been constructed this year at Fort Missoula, Mont., Fort Yellowstone, Wyo., and Fort Sill, Okla., connecting those posts with near-by commercial telegraph offices.

POST TELEPHONE SYSTEMS.

Realizing that efficient telephone communication is as essential in the transaction of military business as in the commercial world, it has been the policy of the Signal Corps to construct modern underground common-battery systems at the larger posts as rapidly as funds become available. Modern underground systems of the type prescribed by General Orders, No. 170, War Department, 1908, were installed this year at Fort Oglethorpe, Ga., Fort Benjamin Harrison, Ind., Fort Riley, Kans., Fort Myer, Va., Fort Adams, Mass., Fort H. G. Wright, N. Y., Fort Terry, N. Y., Fort Washington, Md., Fort Moultrie, S. C., Fort Screven, Ga., Fort Howard, Md., and Fort Barrancas, Fla. The equipment installed at these posts has been the best obtainable. Plans were also prepared for similar systems to be installed at Fort Logan, Colo., Fort Des Moines, Iowa, and Fort Snelling, Minn., during the summer of 1909. At present 36 posts in the United States are provided with the extended systems contemplated by General Orders, No. 170, War Department, 1908. Lack of funds has restricted the remaining posts to the equipment prescribed in General Orders, No. 97, War Department, 1906.

An effort has been made to secure more rigid inspections of all telephone systems at posts, with a view to increasing efficiency of operation and maintenance.

The telephone line from Yellowstone Lake to Sylvan Pass, a distance of 28 miles, was constructed during the period from July 1 to September 27, 1908. The work on this line was very difficult owing to the mountainous, heavily timbered, and rocky country through which the line passes. The following outlying stations in the Yellowstone National Park have communication with each other and with Fort Yellowstone over military lines: Soda Butte, Tower Falls,

Norris, Canyon, Lake, Thumb and Snake River, and Sylvan Pass. Fort Yellowstone also has telephone communication with Gardiner, Mont., a distance of 5 miles. Riverside station is in communication with Upper Basin station over a line of about 18 miles.

TARGET RANGES.

Good reports have been received from the subterranean telephone systems installed at post target ranges. These systems provide telephone communication between the various ranges and the target butts. These systems have been installed at 57 posts in the United States.

During the year plans have been perfected and material purchased for the installation of annunciator buzzer systems at eight of the largest posts of the army. These systems include a push button at each firing point which will ring a buzzer at the target fired at, additional telephone communication, and special arrangements for sending signals to all targets during rapid fire. All circuits and connection boxes will be underground and not interfere with the use of the target range for drill purposes. These systems will be installed at Forts D. A. Russell, Sheridan, Riley, Leavenworth, Sam Houston, Ethan Allen, Niagara, and the Presidio of Monterey.

VISUAL SIGNALING.

In order to provide the means for carrying out the provisions of paragraph 1580, Army Regulations, the Signal Corps has issued to each troop of cavalry, battery of field artillery, company of infantry and coast artillery, and machine gun platoon in the United States, Alaska, Porto Rico, and Hawaii a visual signaling outfit composed of two flag kits and two excellent field glasses. For the machine gun platoons a high-power field glass was added. A sufficient supply of these outfits has been shipped to Manila, P. I., to supply each organization serving in the Philippines. In addition to the flag equipment provided the organizations of the line of the army, the organizations of the Signal Corps have been supplied with and trained in the use of heliographs, acetylene lanterns, and other apparatus for day and night signaling.

During the year reports have been received from various sources showing a growing aversion on the part of officers and enlisted men of the army and the organized militia to the use of the Myer code in visual signaling. At the present time it is necessary for many enlisted men of the Signal Corps to be masters of three codes, viz, the Myer code for visual signaling, the American Morse code for ordinary telegraphy, and the Continental Morse code for wireless and cable service.

SIGNAL CORPS MANUALS.

The signal corps manuals issued by the second section, General Staff, are:

- No. 2, Regulations for Military Telegraph Lines.
- No. 3, Electrical Instruments and Telephones.
- No. 4, Submarine Cables.
- No. 6, Visual Signaling.
- No. 7, General, Property, and Disbursing Regulations.
- No. 8, Apparatus for Fire Control and Direction.

A new edition of Manual No. 2 was distributed during the year, and Manual No. 7 is now in course of revision and will be issued shortly.

ENLISTED MEN.

The enlisted force, which aggregated 1,184 on June 30, 1909, has experienced the following changes: Enlisted and reenlisted, 322, of whom 166 were recruits; deserted, 51, being 4.3 per cent of the total force; died, 5, 0.4 per cent; discharged for disability, 18, 1.5 per cent; discharged by purchase, 65, 5.5 per cent.

DISBURSING DIVISION.

The following statement shows the volume of the work handled during the fiscal year:

Orders placed.....	2, 265
Vouchers audited and paid.....	3, 088
Transportation requests prepared.....	1, 165
Letters and miscellaneous correspondence.....	28, 220
Advertisements for proposals issued (about 8,985 copies being distributed).....	1, 070
Accounts current from officers handling signal corps funds, covering 7 appropriations, examined.....	322
Returns of signal corps property examined.....	2, 037

There was a large number of miscellaneous papers handled in connection with the items mentioned which are not included in this statement, it being impracticable to keep an accurate record of the number.

The following shows the disbursements from Signal Corps appropriations during the fiscal year ending June 30, 1909:

Title.	Amount.	Disbursements.	Balance unexpended.
1. Signal service of the army, 1909.....	\$285,000.00	\$285,000.00	.....
2. Washington-Alaska military cable and telegraph system.....	34,868.39	34,868.39	.....
3. Washington-Alaska military cable and telegraph system, 1909-10.....	202,500.00	200,495.62	\$2,004.38
4. Maintenance, etc., fire-control installations at seacoast defenses.....	145,578.00	145,578.00	.....
Total.....	667,946.39	665,942.01	2,004.38

There has also been disbursed from allotments to the Signal Corps, for fire-control installations, \$205,612.01 out of an aggregate of \$444,537.44; and for encampment and maneuvers of the organized militia, \$4,471.07 from a total of \$20,000.

ELECTRICAL DIVISION.

As in the past the most important function of the electrical division has been the direction of matters pertaining to fire-control installations. The engineering work so directed amounted to \$354,805.27 during the fiscal year, employing a civilian force of 24 technical men on work outside of Washington, D. C. Drawings of signal corps apparatus made in the drafting section of this division number 250. Specifications have been drawn up covering the technical requirements for signal corps apparatus to the number of 20. About 15,000 blueprints have been made and distributed. Bulletins and circulars

covering items of technical interest or changes in equipment are prepared and distributed by this division as occasion requires.

In addition to the work devolving entirely upon this division, the engineering features of the work of the telegraph division are also worked out in the electrical division.

The work of the division has been greatly simplified by the grouping of the various sections in one building, thus facilitating supervision and promoting the cooperation of the hitherto separated units. The inspection of apparatus on orders placed with manufacturers in and about Washington is made under the direction of the electrical division.

TELEGRAPH DIVISION.

The telegraph division receives all requisitions for supplies and equipment purchased from the appropriation "Signal service of the army," supervises the construction of post telephones and target range installations at interior posts, and receives reports concerning the operation of all telegraph, cable, and wireless stations in the army. This division supervises the issue of all visual signaling equipment to the army and all fire-control equipment for the field artillery.

During the year the telegraph division has endeavored to keep in close touch with the mobile army and to cooperate with it in increasing the efficiency of signaling apparatus.

LABORATORY.

The laboratory has been moved into new and more suitable quarters in the same building with the offices occupied by the electrical division, under whose direction the work of this important section is carried on. The laboratory is organized primarily to assist in the development and design of new equipment. As soon as a new instrument or device is thought to be suitable for adoption as standard its connection with the laboratory ends, and its future production is taken up through commercial channels. The shop in its new quarters has been fitted with individual motor drive for the various machines, and its adaptability for the work in hand greatly increased.

The laboratory equipment has been considerably added to during this period, chiefly with a view to preparing for research work along the lines of wireless communication. The limitations of the wireless telephone and telegraph at the present time and the immense potentialities of the subject indicate a desirability for further effort along this line. A laboratory wireless set of 3 kilowatts capacity is in course of installation. As there is no other signal corps station near with which experimental work can be carried on, it will be necessary to establish a test station. This will probably be located at Fort Myer, at a distance of about 3 miles from the laboratory.

III. STANDARD FIRE-CONTROL INSTALLATIONS FOR COAST DEFENSE.

FIRE CONTROL.

The Signal Corps has completed extensive fire-control systems in the districts of Portland, Boston, and Puget Sound, and the main activities in fire-control work now center in San Francisco and the Philippines. In San Francisco portions of the work have been completed and have been transferred to the Artillery Corps. In Subig Bay, Philippine Islands, the system is nearing completion. Work is in progress at Fort Mills, Corregidor Island, and on Caballo and El Fraile islands. The Signal Corps has delivered large quantities of apparatus and material in Honolulu and the Columbia River district, but conditions in these places are such that but little actual construction work can be done at this time, although the Signal Corps preparations for this work are complete.

Standard fire-control installations have now been completed at 26 coast artillery posts and are under way at 11 other posts.

Post telephone systems of the common battery type providing all the connections called for by War Department orders have been completed at Forts Adams, H. G. Wright, Terry, Howard, Washington, Moultrie, and Barrancas. Work is in progress on a similar telephone system at Fort Screven, Ga.

FIRE-CONTROL RESERVE CABLE.

In order to assist in the maintenance of fire-control cables, both subterranean and submarine, and to avoid the delays incident to making repairs, a supply of proper types of cables is being stored in each of the artillery districts as rapidly as funds will permit. It is intended that the reserve shall in the usual case amount to not less than 25 per cent of the total amount of cables installed, in the case of submarine cables. For land cables a much smaller percentage will be required.

CABLE STOREHOUSES.

For the storage of reserve signal corps cable in artillery districts arrangements have been made for cable storage space in the following artillery districts: Portland, Boston, Narragansett Bay, New London, southern New York, Baltimore, Chesapeake Bay, San Francisco, Columbia, Puget Sound, Manila Bay, and Subig Bay. Of the above districts, the storage space at the following points is being provided in existing buildings, using torpedo storehouses and casemates for this purpose: Portland, Boston, Narragansett Bay, New London, southern New York, Baltimore, Chesapeake Bay, San Francisco, Columbia River, Puget Sound, Manila Bay, and Subig Bay. At the following districts entirely new structures are being provided for signal corps use: Portland, Columbia River, and Puget Sound. The storage space so provided varies from 2,000 to 5,000 square feet.

IV. WIRELESS TELEGRAPHY AND TELEPHONY.

The wireless operations of the Signal Corps during the past year have exceeded those of all previous years.

Wireless telegraph stations installed by the Signal Corps.

Name of station.	Call letter.	Power.	Remarks.
<i>United States.</i>			
		<i>Kilowatts.</i>	
Fort Andrews, Mass.	FC	1	Not open to public service.
Fort H. G. Wright, N. Y.	FW	1	Do.
Fort Hancock, N. J.	FN	1	Do.
Fort Leavenworth, Kans.	FL	3	Under construction.
Fort Levett, Me.	FV	1	Not open to public service.
Fort Monroe, Va.	FO	1	Do.
Fort Omaha, Nebr.	FS	3	Do.
Presidio of San Francisco, Cal.	PS	1	Under construction.
Fort Riley, Kans.	FZ	3	Do.
Fort Totten, N. Y.	FT	1	Not open to public service.
Fort Wood, N. Y.	FD	3	Do.
Fort Worden, Wash.	FX	1	Do.
Signal Corps laboratory, Washington, D. C.	SC	3	Do.
<i>Alaska.</i>			
Circle City.	FK	3	Open to public service.
Fort Egbert.	FQ	3	Do.
Fairbanks.	FB	3	Do.
Fort Gibbon.	FG	10	Do.
Kotlik.	FE	1	Under construction.
Nome.	FD	10	Open to public service.
Petersburg.	FP	1	Do.
Fort St. Michael.	FM	3	Do.
Wrangell.	FW	1	Do.
<i>Philippine Islands.</i>			
Manila.	PN	1	Not open to public service.
Corregidor Island.	FH	10	Under construction.
Jolo.	FS	3	Open to public service.
Malabang.	FA	3	Under construction.
Zamboanga.	FM	3	Open to public service.
<i>Army transport service.</i>			
Kilpatrick.	ATK	3	Do.
Logan.	ATL	3	Do.
Sherman.	ATR	3	Do.
Sheridan.	ATS	3	Do.
Thomas.	ATU	3	Do.
Cable ship Burnside.	BS	3	Not open to public service.
Cable ship Joseph Henry.	FR	2	Do.
<i>Artillery harbor tugs.</i>			
Captain Chas. W. Rowell.	RW	1	Do.
Reno.	X	1	Do.
General Randall.	OR	1	Do.
General R. B. Ayres.	FY	1	Do.
Harvey Brown.	HB	1	Do.

Effort has been made during the year to increase the efficiency of the portable field sets for use with the mobile army, and experiments have been recently conducted at the Army Service schools, Fort Leavenworth, Kans., in which, with extremely simplified apparatus, rapidity of installation and reliability have been attained to a remarkable extent. These experiments will be continued with a view of attaining in actual practice the proper sphere of usefulness of wireless in tactical field operations, and of discovering to what extent this method of communication may supplement or supplant the present field-wire system using field buzzers.

In order that the best practice abroad may be known, the Signal Office has purchased a set of field wireless as used in the German army. This set has a power of two kilowatts and a special sectional steel mast with counterpoise, the whole compactly mounted on one military carriage of the pintle type. The generator of the set is 500 cycle, and the principles of the singing arc are utilized.

RADIOTELEPHONY.

For a number of years scientific investigators and inventors have been working upon the problem of transmitting articulate speech directly through the medium of the ether without intervening wires, and such progress has been made that it may be safely stated that wireless telephony to-day is further advanced than wireless telegraphy was ten years ago. Indeed, the theory is relatively much better understood.

Under an allotment from the Board of Ordnance and Fortification, dated November 7, 1907, the Signal Office purchased one complete set of wireless telephone equipment, comprising two stations. At the request of the Chief of Coast Artillery these stations were installed at Fort Monroe, Va., for test and experiment under the direction of the artillery board.

The army appropriation act approved March 3, 1909, contained an item for the purchase and development of wireless telephone apparatus, which became available July 1, 1909, and, accordingly, steps have been taken to initiate the development of equipment in this direction on a more extended scale than has heretofore been possible on account of lack of funds.

It became evident some years since that the attainment of practical success in wireless telephony depended upon devising some method of producing undamped electro-magnetic waves in the transmitter, and a receiver which should be quantitative in its action.

As is now well known, in wireless telegraphy a single dot made by closing the Morse key produces in the transmitting apparatus a series of electro-magnetic wave trains which proceed outward over the surface of the earth with the velocity of light and with the transmitting antenna as the center of ether disturbances. Each of these wave trains has a strong damping factor, and after a very few oscillations the individual waves are reduced to an amplitude which is generally a small fraction of the initial amplitude. In making the dots and dashes of the Morse code by wireless telegraphy, the period of the actual oscillations is so small that the wave trains are separated by intervals of time which are generally very long in comparison with the whole duration of a single train. To illustrate: If the periodic time of the oscillating circuit is, say, one five-hundred-thousandth of a second, and if each group of oscillations or wave train consists of fifty complete cycles and the interruptions are made at the rate of one hundred per second, then the time during which oscillations are actually taking place would be only about 1 per cent of the whole time involved, since fifty times one five-hundred-thousandth is only one hundredth part of a hundredth of a second.

It has been an object for some years to discover some method of producing continuously maintained electro-magnetic oscillations

of a frequency sufficiently great to be applicable to wireless transmission of intelligence. The frequency of oscillations involved may reach several millions per second, so that the natural period obtained in the discharge of condensers and inductances may be utilized for such purposes, but, as stated above, the natural oscillations produced in this manner rapidly die out unless some means may be discovered to produce, instead of rapidly decadent wave trains, a continuous train of sustained oscillations in the oscillating circuit.

Thus far two methods have been employed for generating sustained electrical oscillations which have attained a certain degree of success. First, the principle of the "singing arc." Second, specially constructed high-frequency dynamos.

The first method depends upon the discovery of Thomson and Duddell, that if an electric arc be shunted with a suitable inductance and capacity in series, and the arc operated by a direct current, under certain conditions there is formed a closed oscillatory circuit with a frequency sufficiently high to give electro-magnetic waves suitable for wireless transmission of intelligence. The arc and the arrangement of circuits must be subjected to definite conditions to produce this oscillatory effect. The arc has usually, though not necessarily, one metallic electrode, such as copper, as an anode, and the other electrode is made of specially prepared noncored carbon. The arc itself may be placed in a vessel containing hydrogen or some other gas, such as alcohol vapor or illuminating gas.

Connected with the inductance in the oscillatory circuit by magnetic coupling, is the secondary coil leading to the antenna wire and to earth.

The telephone transmitter used in wireless telephony is identical in principle with the ordinary commercial telephone transmitter, except that it has special provision for cooling, either by circulation of water or by ventilation with air. The reason for this is that when the transmitter is inserted directly in the antenna circuit it must be capable of carrying the actual current which the transmitting arc produces in the antenna. This current often reaches the value of several amperes, as shown by an ammeter placed in the circuit. Although it is possible to insert the transmitter at such a point in the antenna that the current flowing through that point will be a minimum, yet this is not practicable, since the node point of current in the antenna is normally at the extreme top of the antenna, so that in practice the transmitter must be constructed to carry a considerable current. Another reason, however, prevents the transmitter from being placed at the node of current in the antenna, since at this point the potential would be a maximum, which would prevent the use of a telephone transmitter based on using carbon granules, so that in practice the transmitter is inserted near the potential node in the antenna, which is at the point of connection between the antenna and the earth, and is cooled by artificial means as outlined above.

HIGH-FREQUENCY ALTERNATOR.

A condition for success in transmitting speech by electric waves is that there shall be no interruptions in the undamped oscillations below a frequency that is equal to the upper limit of that producing audible sounds. If we are able to produce a dynamo giving a fre-

quency of forty or fifty thousand per second, or above, we may be assured that, however the telephone diaphragm may be affected by such a frequency, the limits of the human ear would prevent its producing any physiological sensation.

The mechanical difficulties in constructing such high-frequency generators are great, yet such progress has been made that it is possible at present to produce a 2-kilowatt generator giving a frequency of 100,000 per second. The attainment of this result involves the use of a rotor of about 1 foot in diameter, operated at a speed of 333 revolutions per second. This means that the peripheral speed of the rotor is 1,046 feet per second, or 714 miles per hour; in other words, this disk would roll from the United States to Europe in four hours. Such a frequency generates electromagnetic waves with a wave length of 1.86 miles, which is suitable for wireless telephony.

The dynamo method offers considerable promise for the future, since the apparatus is much simplified and there is no arc or spark to be controlled in any way.

The Signal Corps has placed an order for such a generator, which it is expected will be delivered within a few weeks.

INTERNATIONAL WIRELESS TELEGRAPHY.

The international wireless-telegraph business of the world is conducted under a treaty signed at Berlin on the 3d day of November, 1906. This treaty was the result of a convention which was participated in by twenty-six of the principal nations. Of these countries, the following have confirmed the treaty: Belgium, Denmark, the Netherlands, Norway, Brazil, Sweden, Mexico, Roumania, Germany and all its protectorates, Great Britain (under certain reservations), Japan (under certain reservations), Spain, Bulgaria, Persia, Russia, Austria-Hungary, Portugal, Turkey.

As the United States up to this time has not given its adherence to the convention, ships flying the American flag find themselves without standing in international wireless telegraphy, as none of the contracting countries is compelled to receive a telegram from the ship of a noncontracting country, and any coastal station in a foreign country may refuse transmission of a message to a station on shipboard subject to a noncontracting country. This condition of affairs was brought forcibly to the attention of the War Department by the cruise of the U. S. army transport *Kilpatrick*, en route from New York to Manila, February 17 to April 23, 1909, and returning May 15 to July 25, 1909. The report from this ship says that she had great difficulty in communicating in different parts of the world, and that in several instances, after ascertaining her nationality, messages were refused.

The history of the whole matter is recorded in the published copy of the treaty, Government Printing Office, 1907, issued by the Bureau of Equipment, Navy Department; in the report of the ambassador of the United States at Berlin to the Secretary of State, November 17, 1906; in Senate Document No. 452, Sixtieth Congress, first session, which shows the action of the War Department, Navy Department, and the Department of Commerce and Labor on the wireless-telegraph convention, and the special message of the President of the United States to Congress; and in the published hearings before the Committee on Foreign Relations of the United States Senate.

In view of the difficulties which ships bearing the United States flag have in communicating with foreign ports, it is recommended that the matter again receive attention, and, through the proper channels, be brought anew to the consideration of the United States Senate.

NATIONAL CONTROL OF WIRELESS TELEGRAPHY.

The only action of the United States Government looking to regulation of wireless telegraphy is the approval of the President of the United States, dated July 29, 1904, of the report of an inter-departmental board appointed by the President to consider the entire question of wireless telegraphy in the service of the National Government.

Owing to the absence of definite regulations, there is considerable confusion in the transmission of wireless messages on the coast of the United States, which interferes very materially with wireless communication between the various seacoast defenses and with our ships at sea. The army now has 12 wireless telegraph stations located at military posts in this country, and 9 stations at points in Alaska.

It is recommended that some action be taken looking to a more definite control of the wireless telegraph situation along our coasts.

V. MILITARY AERONAUTICS.

Progress in aeronautics has been even more rapid during the past year than in the preceding one. Records have been broken in rapid succession, both with dirigible balloons and heavier-than-air machines. The Zeppelin II in Germany has increased its length of time in the air from twelve hours (on July 1, 1908,) to thirty-six hours, covering a distance of 900 miles, and has carried 26 persons at one time. The Wright brothers have increased the length of their flights to two hours and twenty minutes, have carried a passenger one hour and ten minutes, and have flown at a height of 400 feet. Six aviators have crossed the hour mark with aeroplanes, and the number making continuous flights is growing rapidly. Cross-country flights are taking the place of flights in a circle over a limited field, and the latest achievements, in which aeroplanes flew from France to England, crossing the English Channel, and up the Hudson River from Governors Island to near Grant's tomb and return, indicate the practicability of mechanical flight.

All first-class powers except the United States are providing themselves systematically with aerial fleets, Germany and France being notably in the lead.

The United States does not at present possess a modern aeronautical equipment, and it is believed that a systematic plan of development of this military auxiliary for national defense should be inaugurated without delay.

Very respectfully,

JAMES ALLEN,
Brigadier-General, Chief Signal Officer of the Army.

The SECRETARY OF WAR.

REPORT OF THE CHIEF OF COAST ARTILLERY.

REPORT OF THE CHIEF OF COAST ARTILLERY

WAR DEPARTMENT,
OFFICE OF THE CHIEF OF COAST ARTILLERY,
Washington, September 27, 1909.

SIR: In accordance with the requirements of the Army Regulations, which make it the duty of the Chief of Coast Artillery to advise the War Department of the efficiency of the personnel and material of the coast artillery and to make such recommendations in reference thereto as shall tend to promote the efficiency of this arm of the service, I have the honor to submit the following report:

ORGANIZATION AND ADMINISTRATION.

In my annual reports for the past two years I have indicated the necessity for a change in the method of administration of coast artillery troops. The matter has been discussed in detail, and definite recommendations have been made each year with a view to remedying a situation which makes for inefficiency in time of peace and which falls by its own weight in time of war, when it is vital that every system shall be at its best. I refer to the combination of this arm with the other arms of the service in territorial departments commanded, with rare exceptions, by officers with no experience or training in coast artillery matters and who will invariably leave these departments, taking with them the mobile troops, at the outbreak of hostilities. The objections to this condition are so manifest, the remedy so apparent and so easily applied, that an extended discussion of the matter, after the detailed and minute analyses in my annual reports for 1907 and 1908, is deemed unnecessary.

An examination of the duties of the Chief of Coast Artillery as laid down in the statutes, regulations, and orders shows that he is in fact responsible for the efficiency of both the personnel and material of the coast defense, and that if either is inefficient he can not evade this responsibility unless his advice in the case has been disregarded by his superiors. In consequence, all matters relating to both men and material of the coast artillery are referred to him and his recommendations have, uniformly, great weight with the War Department. That is to say, the Chief of Coast Artillery practically controls and is responsible for the welfare and efficiency of some 20,000 officers and men, as well as for the guns, emplacements, and accessories of all the

Responsibilities of
Chief of Coast Artillery.

fortifications of the country. In no other service than our own and in no other instance in our service is a task of this magnitude intrusted to an officer less in rank than a major-general.

The geographical situation of the coast defenses of the United States is such that they fall naturally into three territorial departments. It is believed to be clearly established that the efficiency of the coast defenses demands that these departments be commanded by brigadier-generals appointed from the coast artillery and that the head of the Coast Artillery Corps should be a major-general of coast artillery and in command of the corps.

I, therefore, renew the following recommendations made in my last annual report:

(a) That the coast artillery be organized for command and administration as a separate territorial division of the army, composed of three territorial departments.

(b) That the coast artillery be increased by three brigadier-generals of coast artillery, whose duty shall be to command the coast artillery departments.

(c) That the Chief of Coast Artillery be made a major-general and placed in command of the coast artillery division.

With regard to these recommendations, so much of them as relates to the organization of coast artillery departments can be put into effect by a War Department order, but that portion relating to the creation of coast artillery general officers will require congressional legislation. The organization of the coast artillery departments is considered to be a matter of such importance, so necessary to the efficiency of the coast artillery, that I urgently recommend:

(a) That a War Department order be issued creating and organizing three coast artillery departments, with territorial limits as heretofore recommended by me.

(b) That colonels of coast artillery be given command of these departments until coast artillery general officers are appointed.

(c) That the necessary steps be taken by the War Department to have a suitable bill presented to Congress, embodying the recommendations made herein in regard to the creation of a separate coast artillery division and the authorization and appointment of coast artillery general officers.

PERSONNEL.

ACTUAL STRENGTH OF THE COAST ARTILLERY CORPS.

The actual strength of the Coast Artillery Corps on July 1, 1909, was 558 officers and 18,648 enlisted men. The authorized strength on that date was 672 officers and 19,321 enlisted men, so that a shortage existed of 114 officers and 673 enlisted men. On July 1, 1908, the corresponding shortage of enlisted men was 5,949. The fact that the enlisted strength is now so nearly that authorized by law is believed to be largely due to the increased pay in all grades authorized by Congress last year, combined with the increased opportunities afforded by the grades of master electrician, engineer, electrician sergeant, master gunner, etc. These grades provide a means by

which the ambitious coast artillery soldier can work himself up from a private at \$15 a month to a master electrician at \$99 per month. When these grades were first authorized, they were thrown open to civilians in order to obtain the requisite technical skill. Now, however, only graduates of the enlisted men's division of the Coast Artillery School are eligible for appointment to these grades, and the standard of qualifications for the various grades is higher than ever before. The effect of this on the enlisted personnel of the coast artillery is excellent and there is now no lack of suitable material in the coast artillery for the higher grades.

The shortage of officers in the coast artillery is in the grade of second lieutenant. This shortage is principally due to the stipulations of the act of January 25, 1907, which provided that only one-fifth of the vacancies in the grade of second lieutenant authorized by the act should be filled in each fiscal year. The increments for July 1, 1909, and for July 1, 1910, 44 and 43, respectively, yet remain to be filled.

In connection with this shortage of officers in the coast artillery, attention is again called to the desirability of increasing the number of cadets at the United States Military Academy to such an extent as to enable a great proportion of vacancies in all branches of the service to be filled annually by graduates of that academy. Of the 600 officers in the coast artillery on January 1, 1909, only 279 have had the advantage of the West Point training. Of those who entered before the beginning of the Spanish-American war, 97.6 per cent are graduates and of those who entered since only 33 per cent are graduates. The proviso in the Military Academy bill as reported by the Senate Committee on Military Affairs and lost on the floor of the Senate by a point of order at the last session of Congress would, it is believed, well meet the needs of the service in this respect, and the matter is considered to be of such importance, not only to the coast artillery but to the entire service, that I earnestly recommend that the War Department endeavor to have legislation embracing the subject matter of the proviso referred to enacted at the coming session of Congress.

Shortage of officers.

Increase of United States Military Academy corps of cadets.

The following table shows the actual condition as to officers of the Coast Artillery Corps for duty in each artillery district on the 11th day of September, 1909.

[Temporary absentees not considered.]

Artillery districts.	Field officers.			Staff officers.		Company officers.			Total.	Number of companies.
	Colonels.	Lieutenant-Colonels.	Majors.	Captains.	Lieutenants.	Captains.	First lieutenants.	Second lieutenants.		
Portland:										
Authorized.....	1	1	3	3	1	12	12	12	45	12
For duty.....	1	1	1	3	1	8	7	8	29	
Shortage.....			2			4	5	4	16	
Portsmouth:										
Authorized.....			1		2	1	1	1	6	1
For duty.....					1	1	1	1	4	
Shortage.....			1		1				2	
Boston:										
Authorized.....	1	1	4	3	1	11	11	11	43	11
For duty.....	1	1	3	2	1	8	9	4	29	
Shortage.....			1	1		3	2	7	14	
New Bedford:										
Authorized.....					1	1	1	1	4	1
For duty.....					1	1		1	2	
Shortage.....					1		1		2	
Narragansett Bay:										
Authorized.....	1	1	2	3	1	8	8	8	32	8
For duty.....	1		1	2	1	8	2	3	18	
Shortage.....		1	1	1			6	5	14	
New London:										
Authorized.....	1	1	2	3	1	10	10	10	38	10
For duty.....	1		1	3	1	5	8	5	24	
Shortage.....		1	1			5	2	5	14	
Eastern New York:										
Authorized.....	1	1	2	3	1	10	10	10	38	10
For duty.....	1	1	1	3	1	9	3	3	22	
Shortage.....			1			1	7	7	16	
Southern New York:										
Authorized.....	2	1	2	3	1	15	15	15	54	15
For duty.....	2		2	3		13	5	9	34	
Shortage.....		1			1	2	10	6	20	
Delaware:										
Authorized.....	1		1	2	1	7	7	7	26	7
For duty.....			1	2	1	2	7	5	18	
Shortage.....	1					5		2	8	
Baltimore:										
Authorized.....		1	2	2	1	7	7	7	27	7
For duty.....		1	1	2	1	4	5	4	18	
Shortage.....			1			3	2	3	9	
Potomac:										
Authorized.....	1		1	2	1	5	5	5	20	5
For duty.....	1			1		3	4	2	11	
Shortage.....			1	1	1	2	1	3	9	
Chesapeake Bay and Coast Artillery School:										
Authorized.....		1	6	3	1	10	10	10	41	10
For duty.....		1	6	3	1	5	10	3	29	
Shortage.....						5		7	12	
Cape Fear:										
Authorized.....	1			1	1	3	3	3	12	3
For duty.....	1			1		2	3		7	
Shortage.....					1	1		3	5	
Charleston:										
Authorized.....	1		1	2	1	5	5	5	20	5
For duty.....			1	2	1	4	2	2	12	
Shortage.....	1					1	3	3	8	
Savannah:										
Authorized.....	1			1	2	4	4	4	16	4
For duty.....	1			1	1	3	3	1	10	
Shortage.....					1	1	1	3	6	
Key West:										
Authorized.....		1		1	2	3	3	3	13	3
For duty.....		1		1	1	2	2	2	9	
Shortage.....					1	1	1	1	4	
Tampa:										
Authorized.....			1		2	2	2	2	9	2
For duty.....					2	2	3	1	8	
Shortage.....			1				1	1	1	
Pensacola:										
Authorized.....		1	1	2	2	5	5	5	21	5
For duty.....		1		2	1	1	5	3	13	
Shortage.....			1		1	4		2	8	

a Indicates surplus.

The following table shows the actual condition as to officers of the Coast Artillery Corps for duty in each artillery district on the 11th day of September, 1909—Continued.

Artillery districts.	Field officers.			Staff officers.		Company officers.			Total.	Number of companies.
	Colonels.	Lieutenant-Colonels.	Majors.	Captains.	Lieutenants.	Captains.	First lieutenants.	Second lieutenants.		
Mobile:										
Authorized.....			1		2	3	3	3	12	3
For duty.....					2	2	2	2	8	
Shortage.....			1			1	1	1	4	
New Orleans:										
Authorized.....		1			2	2	2	2	9	2
For duty.....		1			2	1	1	1	5	
Shortage.....						1	1	1	3	
San Diego:										
Authorized.....			1		2	2	2	2	9	2
For duty.....			1		2	2	1	2	8	
Shortage.....							1		1	
San Francisco:										
Authorized.....	1	2	4	3	1	18	18	18	65	18
For duty.....	1	2	4	2		12	10	8	39	
Shortage.....				1	1	6	8	10	26	
Columbia:										
Authorized.....			1	1	1	4	4	4	15	4
For duty.....			1	1	1	3	4	1	11	
Shortage.....						1		3	4	
Puget Sound:										
Authorized.....	1	1	3	3	1	13	13	13	48	13
For duty.....	1		3	3	1	10	8	6	32	
Shortage.....		1				3	5	7	16	
Honolulu:										
Authorized.....			1	1	1	2	2	2	9	2
For duty.....			1	1		1	2	1	6	
Shortage.....					1			1	3	
Subic Bay:										
Authorized.....			1		2	3	3	3	12	3
For duty.....			1		2	2	5		10	
Shortage.....						1	a 2	3	2	
Manila Bay:										
Authorized.....			1	2	1	4	4	4	16	4
For duty.....			1	2	1	3	8		15	
Shortage.....					1	a 4		4	1	
Total shortage.....	2	4	12	4	11	53	50	92	228	.....

a Indicates surplus.

PRESENT AUTHORIZED STRENGTH AND STRENGTH REQUIRED.

The authorized maximum strength of the Coast Artillery Corps is 701 officers and 19,321 enlisted men; the number required to furnish one manning detail for the seacoast fortifications already constructed and the additional defenses recommended by the National Coast Defense Board in its report of February, 1906, is 2,278 officers and 55,110 men.

Considered as a whole the fortifications of the United States as well as of our insular possessions are now well advanced toward completion; but, while this is so, it should always be borne in mind that these fortifications if completed would furnish only the requisite material for our coast defense, that an adequate and trained personnel would still be necessary to operate these defenses, and that without such adequate force of trained men, capable of efficiently handling the different and complex elements of our seacoast defenses, the defenses themselves would be useless, and all the expenditures made upon them, amounting in round numbers to \$100,000,000, would be wasted

Necessity of adequate personnel to operate seacoast defenses.

REPORT OF CHIEF OF COAST ARTILLERY.

The following table shows the actual condition as to officers of the Coast Artillery in each artillery district on the 11th day of September, 1901.
[Temporary absences not considered.]

Artillery districts.	Field officers.			Staff officers.		Company officers.	
	Colonels.	Lieutenants-Colonels.	Major.	Captains.	Lieutenants.	Captains.	First lieutenants.
Portland:							
Authorized.							
For duty.				3	1	12	12
Shortage.						8	5
Portsmouth:							
Authorized.					1		
For duty.					12	1	1
Shortage.					1	1	1
Boston:							
Authorized.							
For duty.				3	1	11	11
Shortage.						3	9
New Bedford:							
Authorized.				1	1		
For duty.						3	2
Shortage.							
Narragansett Bay:							
Authorized.					1	1	1
For duty.					1		
Shortage.							
New London:							
Authorized.				3	1	9	8
For duty.					1	3	12
Shortage.							5
Southern New York:							
Authorized.				3	2	10	10
For duty.						5	4
Shortage.							
Southern New York:							
Authorized.				3		10	10
For duty.						3	10
Shortage.							
Delaware:							
Authorized.						15	15
For duty.						5	5
Shortage.						10	9
Baltimore:							
Authorized.							
For duty.							
Shortage.							
Potomac:							
Authorized.							
For duty.							
Shortage.							
Chesapeake Bay and Coast Artillery:							
School:							
Authorized.							
For duty.						4	4
Shortage.							
Cape Fear:							
Authorized.							
For duty.						10	10
Shortage.							
Charleston:							
Authorized.							
For duty.							
Shortage.							
Savannah:							
Authorized.							
For duty.							
Shortage.							

Indicates surplus.

REPORT OF CHIEF OF ARTILLERY

Following table shows the actual composition of the Artillery in each district on the 1st day of January, 1911.

Artillery districts.	First Lieutenants.	Second Lieutenants.	Third Lieutenants.	Fourth Lieutenants.	Artillery Sergeants.	Artillery Privates.	Total.
Authorized.....	10	10	10	10	10	10	60
For duty.....	10	10	10	10	10	10	60
Shortage.....							
Orleans:							
Authorized.....	10	10	10	10	10	10	60
For duty.....	10	10	10	10	10	10	60
Shortage.....							
Mingo:							
Authorized.....	10	10	10	10	10	10	60
For duty.....	10	10	10	10	10	10	60
Shortage.....							
San Francisco:							
Authorized.....	10	10	10	10	10	10	60
For duty.....	10	10	10	10	10	10	60
Shortage.....							
San Diego:							
Authorized.....	10	10	10	10	10	10	60
For duty.....	10	10	10	10	10	10	60
Shortage.....							
San Juan:							
Authorized.....	10	10	10	10	10	10	60
For duty.....	10	10	10	10	10	10	60
Shortage.....							
San Pedro:							
Authorized.....	10	10	10	10	10	10	60
For duty.....	10	10	10	10	10	10	60
Shortage.....							
San Juan:							
Authorized.....	10	10	10	10	10	10	60
For duty.....	10	10	10	10	10	10	60
Shortage.....							
Total shortage.....							

PRESENT AUTHORIZED STRENGTH OF ARTILLERY

The authorized maximum strength of the Artillery is 101 officers and 19,110 enlisted men. The present strength of the Artillery is 101 officers and 19,110 enlisted men. The additional authorized strength of the Artillery is 101 officers and 19,110 enlisted men. The Defense Board in its report of 1910 estimated the total strength of the Artillery at 101 officers and 19,110 enlisted men.

Considered as a whole the Artillery is well equipped for our coast defense. It will be necessary to increase the Artillery force of trained men to meet the increasing complexity of our coast defense. The Artillery would be required to mount in some instances.

or worse than wasted, as they would have lulled us into a false sense of the security of our fortified harbors from attack by an enemy.

It is believed to be established beyond dispute that in order to insure the efficient handling of our coast defenses in time of war it is necessary that we should maintain in time of peace at least one full manning detail of coast-artillery troops. This view has been expressed repeatedly not only by myself and my predecessors as chief of artillery, but by practically all general officers who have commanded departments containing a preponderance of coast artillery. This view has also been expressed from time to time by various Secretaries of War and leading members of the Military Committees of Congress. In fact, I think it quite safe to say that it is wholly accepted by all who have an intimate knowledge of the conditions and requirements of our coast defenses. In time of war we must have at each place liable to attack such a number of coast-artillery troops that they will be sufficient not only to form a full manning detail but to maintain a full manning detail, allowing for absentees, sick, and wounded. And in case of a long-continued attack or siege it is more than probable that for some of the elements, if not all, it will be necessary to maintain more than one full manning detail in order to provide reliefs.

The question of the necessity of having a full manning detail in time of peace has not been disputed, but there have been from time to time some differences of opinion as to how this manning detail should be provided.

Opinion, however, has in the last year or two become crystallized and the Secretary of War in his annual report of 1908 thus clearly states what he defines to be the adopted policy of the War Department in this matter:

The situation in regard to the present strength of the coast artillery and the strength that will ultimately be required may be briefly stated as follows: One complete manning detail for all the elements of all the coast defenses constructed and proposed in the United States, the insular possessions, and the entrance of the Panama Canal is unquestionably needed in time of peace. To provide such a detail will require 2,278 officers and 55,110 men. Considering it improbable that in the near future Congress would authorize in time of peace so large a number of men for the coast artillery alone, the department adopted the plan of asking Congress to furnish a portion of this number, relying on the militia of the seacoast States to furnish the remainder. The portion to be furnished by the regular establishment has been fixed at a complete manning detail for all mines, power and light plants, for all gun defense in insular possessions, and one-half the number required for gun defense in the United States.

In order to carry out this policy for providing one manning detail for all defenses, constructed and proposed, it will be necessary to provide from the coast artillery militia 902 officers and 21,204 enlisted men, and to increase the regular coast artillery by 675 officers and 14,584 men. These requirements are shown in detail as follows:

	Officers.	Men.
For all mines, power and light plants of home ports.....	182	5,300
For all mines, power and light plants of insular and canal ports.....	43	1,270
For all gun defenses of insular and canal ports.....	249	6,131
For one-half of all gun defenses of home ports.....	902	21,205
Total regular coast artillery required.....	1,376	33,906
Total militia coast artillery required.....	902	21,204
Total force, regulars and militia, required.....	2,278	55,110

As to the regular coast artillerymen, 1,376 officers and 33,905 men, required by the policy of the War Department for manning the defenses of our home and insular ports, only 701 officers and 19,321 men are now authorized by law, leaving 675 officers and 14,584 men yet to be provided for by congressional legislation.

The foregoing relates to the personnel for the armament now completed or under construction and, in addition, that proposed by the Taft Board as necessary for a complete national defense.

If the former only is considered, that is, the personnel for the armament already installed or being constructed both at home and in foreign possessions, the shortage existing at this time is somewhat less, but is still considerable, amounting to 301 officers and 7,699 men, shown in detail as follows:

	Officers.	Men.
The strength of the Coast Artillery Corps as now authorized by law is, as stated (excluding chaplains)	701	19,321
Of this authorized strength.....	174	4,970
were specially provided by the artillery increase bill of January 25, 1907, for manning the mines, power plants, and search-lights of home ports.		
This leaves	527	14,351
as the personnel now authorized for the gun defenses of home ports and for both the gun and mine defenses of insular ports.		
On January 25, 1907, the date the artillery increase bill passed, there were required to man the gun defenses of <i>home ports</i> already constructed	1,350	36,863
To man one-half the gun defenses then constructed there were, therefore, required	675	18,431
The personnel now authorized for the gun defenses of home ports and the gun and mine defenses of insular ports	527	14,351
was, therefore, just	148	4,080
short of the number required to man the gun defenses constructed in home ports alone on the day the bill passed.		
Since the bill passed, no new guns have been installed, but the fortification bill of 1908 provided for a number of new guns to be mounted in Puget Sound which will require for <i>one-half of one manning detail</i>	4	116
Besides these new guns, there have been installed or have been appropriated for, since the bill passed, in Hawaii and the Philippines guns and mines which will require for <i>one manning detail</i> ..	149	3,503
When, therefore, the defenses appropriated for since the artillery increase bill was passed are completed, which should be within the next 18 months, there will be required to furnish the quota of regular coast artillerymen for one manning detail for these new defenses.	153	3,619
If to these numbers there are added	148	4,080
which the Coast Artillery Corps, as authorized by the increase bill, was short of the personnel required for <i>one-half of one manning detail</i> for the guns in home ports then mounted, it will be seen that the authorized strength of the Coast Artillery Corps is just	301	7,699
short of the personnel required to furnish <i>one complete manning detail</i> for the mines in home ports, and for guns and mines in insular ports, and for <i>one-half of one complete manning detail</i> for the guns in home ports—all of which defenses have been or are now being installed.		
If the defenses now being installed in Hawaii and the Philippines are provided from the authorized maximum strength (701 officers, 19,321 men) of the Coast Artillery Corps, with one complete manning detail, as it is believed should be done, there will remain for the gun defense of home ports now installed	378	10,848
which is the total personnel now authorized for gun defense	527	14,351
less the personnel required for the gun and mine defenses	149	3,503
of Hawaii and the Philippines.	378	10,848

	Officers.	Men.
As there are required for one manning detail for the gun defenses now installed in home ports, as already stated.....	1,350	36,863
it will readily be seen that the.....	378	10,848
remaining for the gun defenses installed in home ports after the gun defenses being installed in Hawaii and the Philippines are manned, is less than 30 per cent of one complete manning detail for the home guns.		

It can hardly be presumed that Congress appropriated for the additional defenses provided since the last artillery increase bill was passed, or that it will continue to appropriate for new and costly coast defenses either for our home ports or our insular possessions, without some thought or intention of providing the necessary trained personnel to insure an adequate return for the enormous sums expended on these defenses. Under the last artillery increase bill five years were required to provide the 296 officers authorized by the bill—an increment of one-fifth of this number only being annually authorized to insure the procuring of men with the requisite qualifications for second lieutenants of coast artillery. As the last of the five increments authorized by the act will be open for appointment on July 1, 1910, it is believed that it is time some consideration was being given by the War Department and Congress toward making another coast artillery increase to provide the necessary manning detail for the new defenses added since the last increase was made and for providing the necessary quota of regular coast artillery officers and men required for one-half of the manning detail for the guns of the United States already mounted. The total personnel thus required is, as above shown, 301 officers and 7,699 men; and it is therefore earnestly recommended as being in the best interests of the public service that a bill providing for this increase in the coast artillery be prepared by the War Department for submission to Congress at either its next or the succeeding session.

Presumed intent of Congress to provide personnel required to operate seacoast defense for which appropriations have been made.

THE MILITIA COAST ARTILLERY RESERVES.

The militia required by the policy of the War Department as coast artillery reserves for manning one-half of the gun defenses, constructed and proposed, of the United States proper is, as has been already shown, 902 officers and 21,204 men. Since it was first practically demonstrated in the joint regular army and militia coast artillery maneuvers of 1907 that militia could well be utilized in connection with the manning of our gun defenses, the War Department has encouraged in every practicable way the development of this important adjunct to the national coast defense, and as a consequence much progress has been made, both in the number of militia reserves and in the material advance in efficiency as coast artillerymen of the greater part of these state troops.

With a view to expediting the practical instruction of these militia coast artillery reserves, as well as to promoting good fellowship and kindly relations between the regular and militia coast artillery troops, an effort has been made, in carrying out the policy of the War Department regarding these militia reserves, to have the state authorities of each seacoast State interested provide a militia coast artillery company for each regular coast artillery company assigned to gun defense in

Progress in organization and instruction of militia coast artillery reserves.

the fortified harbors of the State. This duplication of companies is confined to the gun defense alone, owing to the nature of submarine mine work and the many difficulties that would be connected with any attempt to give practical instruction in mine work to militia companies.

Of the 170 regular coast artillery companies now authorized, 121 are assigned to the gun defenses of the United States proper, and 41 to the mine defense, the remaining 8 companies being assigned to the gun and mine defense of our insular possessions.

During the past year the War Department has succeeded in getting these coast States interested in organizing or arranging for the organization of more than enough companies of militia reserves to duplicate the existing authorized regular coast artillery companies assigned to gun defense, there being at the present time 107 companies of militia coast artillery reserves actually organized and 31 companies in process of organization or under promise by the state authorities that they will be organized within the next few months, which will make when all are organized a total of 138 companies of militia coast artillery reserves.

It therefore appears that the efforts of the War Department to provide militia coast artillery reserves is in advance of federal legislation providing for regular coast artillery personnel, as there are at present 12 more militia coast artillery reserve companies organized or in process of organization than there are companies of regular coast artillery authorized for gun defense. The details regarding the organization or status of the militia reserve companies at the present time are set forth in the following table, which shows in addition that, whereas in some seacoast States more militia coast artillery reserves have been provided than are necessary to duplicate the regular coast artillery companies assigned to gun defense in the fortified harbors of these States, in other States a less number than are necessary have as yet been organized or provided.

State.	Total strength required.		Total number of companies required to duplicate regular companies now organized.	Number of companies organized.	Organizations.	Strength.		Number of companies expected to be organized in near future.	Remarks.
	Offi- cers.	Men.				Offi- cers.	Men.		
Maine.....	55	1,300	9					12	It is understood that a Coast Artillery Corps will be created by the transfer of the First Regiment of Infantry, National Guard of Maine. The details of this organization of such a corps are now being worked out.
New Hampshire.....	18	384	2	4	Independent companies.	12	216		
Massachusetts.....	73	1,780	9	12	Corps.	48	768		
Rhode Island.....	60	1,379	8	16	2 artillery districts of 8 companies each.	69	804		
Connecticut.....	63	1,441	7	14	Corps.	51	829		
New York.....	76	1,904	13	31	Corps—3 artillery districts of 12, 10, and 9 companies, respectively.	115	2,150		
New Jersey.....	28	723	6						The State of New Jersey has not indicated that it will provide any coast artillery reserves.
Delaware.....	28	685	4					2	
Maryland.....	31	680	3	1	Independent company	3	41	4	Under date of May 15, 1909, the adjutant-general of Delaware stated that he would exert every effort to effect the organization of 2 companies of coast artillery reserves.
District of Columbia.....	23	475	4						
Virginia.....	63	1,494	8	2	Independent companies.	6	127	1	A battalion of coast artillery has recently been authorized by an act of Congress for the reorganization of the District of Columbia Militia, but the details of this organization have not yet been completed.
North Carolina.....	13	317	2	4	Corps.	14	182		
South Carolina.....	22	540	4	2	Independent companies.				The adjutant-general of Virginia informed the War Department that it is the intention to organize an additional company at an early date.
Georgia.....	13	278	3	4	Corps.	15	148		
Florida.....	56	1,277	9	1	Independent company.	3	70	1	Strength of companies not known.
Alabama.....	21	474	2	2	Independent companies.	6	104		

Under date of Mar. 20, 1909, the adjutant-general of Florida stated that certain infantry organizations have signified a desire to be transferred to coast artillery, and that opportunity is being given them of making formal application for transfer. Steps have been taken to organize a company of coast artillery at Pensacola, but it has not yet been mustered into service.

Louisiana.....	17	358							1	
Texas.....	22	447	2	1	Independent	3	50		2	
California.....	90	2,249	16	7	pany.	28	406		1	
Oregon.....	34	717	3	1	Independent	3	70		3	
Washington.....	96	2,272	12	5	pany.	21	315		4	
Ohio.....					Corps.....					
Total.....	902	21,204	126	107		397	6,281		31	

Company B, field artillery, Louisiana National Guard, has been assigned to coast artillery duties, but its transfer has not yet been effected.

Under date of Apr. 12, 1909, the adjutant-general of Oregon stated that it is intended to organize an additional company of coast artillery at Marshfield, Ore., at an early date. Under date of Mar. 9, 1909, the adjutant-general of Washington informed the War Department that it is expected to organize three more companies of coast artillery before the 1st of September.

A proposition has been informally presented to the War Department that the State of Ohio assign the Cleveland Grays, of the city of Cleveland, to coast-defense duties, and that they be assigned to fortifications on the Atlantic coast. The question is in suspension awaiting the action of the state authorities.

^a The figures given as to the number of officers and men are approximate.

It will be noted that the foregoing table shows that the State of New Jersey has not, up to the present time, indicated that it will make any provision for militia coast artillery reserves; and, on the other hand, that the State of Ohio has indicated that, if acceptable to the War Department, it would be inclined to set apart one of its best organizations for coast-defense duty.

In reference to the militia reserve companies provided for in some of the States in excess of the number required to duplicate the regular coast artillery companies assigned to gun defense, it should be had in mind that should these militia coast artillery reserves, in case of emergency, be called into the service of the United States under the provisions of section 4 of the militia law, these extra companies, if more than are required to man the guns contemplated by the War Department policy to be assigned to the militia, would be available for assignment to guns in coast fortifications which might be unmanned, owing to lack of regular coast artillery companies; or these extra companies could be utilized either as a second relief or in increasing the strength of other militia coast artillery companies so as to enable the latter companies to fully man the guns assigned them—it being noted that the strength of the militia companies is ordinarily less than is required to man either mortar or large caliber gun batteries.

Although the foregoing table makes a very satisfactory showing, so far as the number of militia reserve companies is concerned, it should be borne in mind that these companies, as a rule, have had very little coast artillery training, and that such troops, with one or two weeks' annual training at the seacoast forts and such instruction as can be given them in their armories at other times, can never be made equal to regular coast artillery troops which are given daily drill at the forts for nine months every year and daily indoor instruction for the remaining three months. It is, however, confidently believed that if these reserves be given the annual one or two weeks' outdoor training as proposed and such indoor instruction in seacoast artillery work as may be practicable in their armories with the means provided by congressional appropriations for apparatus, such as was made at the last session of Congress, they can, at the outbreak of war, render most valuable assistance which could not otherwise be obtained from any source, and after a short time can be brought to a full measure of proficiency.

In the majority of States the organizations have as yet been able to get but little more than a start on the way toward a satisfactory status as coast artillery, and it would be unreasonable to expect much more at this time considering the difficulties the new organizations have encountered in getting any kind of coast artillery instruments or apparatus for their armory work, the lack of trained instructors, the fact that the weapons they are to use are mounted in distant forts and can not be carried to or well duplicated in their armories, and the trouble they have in getting away, even for a few days, from their civil occupations to take part in the annual maneuvers with regular coast artillery at the guns. However, in a few States where the interest in coast artillery work has extended over a number of years, during which the organizations have had considerable armory training with improvised coast artillery instruments and

apparatus, with a week or ten days' actual practice annually with heavy guns at near-by forts, the progress made and the degree of efficiency attained is quite remarkable—so much so, indeed, that it is confidently believed in the event of sudden war these organizations would now be able to give a good account of themselves. If they continue to progress as they have in the past they will be all that could possibly be hoped for in militia coast artillery reserves.

The great enthusiasm shown by these militia reserves, as a rule, in taking up coast artillery work under such trying circumstances, the cordial assistance that has everywhere been given them by the regular coast artillery during the annual coast artillery maneuvers, the help that has been recently given by Congress in the way of appropriations for armory equipment, and the interest and support that has been extended to them by the War Department, all lead to the belief that the now untrained militia coast artillerymen will eventually develop into a force which will prove of much value to the nation in the event of attack on our seacoast, and of which all who have taken part in its development may be justly proud.

In order to accomplish satisfactory results in the training of militia coast artillery, it is essential that the armories of these organizations be equipped with such coast artillery material as can be installed therein. The War Department has accordingly designed a set of dummy guns and mortars with all accessories pertaining to the service thereof, for installation and use in militia coast artillery armories. Progressively, as organizations are provided with suitable armories by the States and as the instruction of the personnel of the separate organizations warrants, estimates should be submitted to Congress for funds necessary to provide these dummy guns and other articles of armory equipment. It is thought that the coast artillery troops of Massachusetts, Connecticut, and New York are now in position to have such armory equipment provided, and it is recommended that the necessary estimates to provide and install the equipment in these States be submitted to Congress at the earliest practicable time.

**Necessity for
proper equipment of
armories.**

THE COAST ARTILLERY SUPPORTS.

Besides these trained regular and militia coast artillerymen required to furnish one complete manning detail for all our coast defenses constructed and proposed, it must be further remembered, as stated in my annual report for last year, that there are certain other troops, armed as infantry, cavalry, and field artillery and designated "coast artillery supports," which will be absolutely necessary for the defense of the rear of the forts from attack by small parties of the enemy which may be landed from hostile ships for the purpose of making such attack while the ships engage the forts in front. Such supports were unnecessary in the days when seacoast forts were high-walled inclosures, with or without a surrounding moat and often with a counterscarp, redoubt, and glacis on the land front. The troops garrisoning such forts were relied on and expected to defend it from attack from any and all sides. At the present day, however, the so-called seacoast forts consist of a number of detached works, concrete and earthen embankments—often separated by con-

siderable distances, and behind which the heavy guns are usually so mounted as to be hidden from the front, but completely open and exposed to view from the rear. It is, therefore, absolutely necessary for the efficient defense of a harbor that men other than those which man the gun and mine defenses of the forts shall be provided to protect the forts and their accessories, fire-control stations, power plants, and searchlights from attack from the rear.

It is roughly estimated that about 55,000 field troops (infantry, cavalry, and field artillery) will be needed in time of war to make the coast fortifications in the States, the Isthmus, and the insular possessions secure against attacks such as may be expected from the rear. That is, it will require approximately the same number of field troops to give this protection as it does coast artillery to man and fight the defenses on the sea front of the fortifications.

The mobile troops required to defend the rear of the defenses of our home ports, as well as a small portion of those believed to be necessary for the defense of Oahu, might well, it is considered, be furnished by the militia of the seacoast States concerned and by the militia of Oahu, but all such troops as are required for the defenses of our insular possessions other than Oahu and the major part of those required for Oahu should unquestionably be regular troops of the mobile army.

The present strength of the mobile army is, however, entirely too small to permit of the assignment of any regular troops as coast artillery supports, and it is therefore absolutely necessary, if a proper military policy is to be maintained by this Government, that the present authorized strength of the mobile army be increased by the number of troops needed for the defense of the rear of the forts in our insular possessions.

The need for troops for this purpose is most pressing in the island of Oahu. The strategic importance of this island, both with reference to our Pacific coast and the Far East, and the progress that has been made in the installation of the seacoast fortifications, render it highly advisable that early action be taken to provide the mobile army troops needed to place this island in a condition for successful defense. That the military importance of Oahu is appreciated by Congress is evidenced by the amount appropriated for fortification work, over \$3,000,000, and by the appropriations toward the construction of a naval base that will involve an ultimate expenditure of about \$10,000,000. While these fortifications are absolutely necessary as well as sufficient for the defense of the naval base and Honolulu against a purely naval attack, they are particularly vulnerable to attack from the rear, and it will be necessary to hold the entire island to protect them and also the naval base from such attack. The need of providing regular troops for this purpose is, in my opinion, so urgent as to make it the most pressing military necessity now confronting the United States; and I therefore earnestly recommend that a bill authorizing an increase in the present authorized strength of the mobile army for the purpose of furnishing the regular mobile army troops needed for the defense of the island of

Number of field troops required for service as coast artillery supports.

Increase of mobile army to provide necessary coast artillery supports.

Special needs of island of Oahu, Hawaii, for its successful defense.

Oahu be prepared as soon as practicable, with a view to its submission to Congress at the next session.

Attention should be called to the fact that even if these recommendations for the increase of both the coast artillery and the mobile army are approved by the War Department and Congress should authorize the increase at its next session, it would be five years before the increase is consummated, assuming that a proviso such as that in the last artillery increase bill would be made in the bills regarding the appointment of the officers authorized; and that if the remaining half of the quota of regular coast artillery necessary to carry out the approved policy of the War Department and the remaining portion of the regular mobile army supports were then at once authorized by Congress it would take five more years to consummate the increase thus authorized. Under the best conditions it would therefore appear that it would take at least ten years to provide the quota of regular coast artillery required to carry out the policy of the War Department, and also to provide the regular mobile army supports needed for the defense of the rear of our insular forts and the defense of the island of Oahu. It is therefore believed it would be in the best interests of the nation if the matter of the preparation of the bills herein recommended were taken up by the War Department at once, and every endeavor thereafter made by the department to have these bills made law.

Immediate action
by Congress for in-
crease of both coast
artillery and mobile
army deemed urgent.

EXAMINATION OF OFFICERS FOR PROMOTION.

It is believed that no one thing has done more to raise the standard and increase the efficiency of officers of the army than the requirement that they shall pass successfully an examination before being promoted. Not only has a standard of proficiency been established but officers have been led into habits of study beyond that needed for preparation for these examinations and the service schools have, as a corollary, raised the standard to be attained by their graduates.

At the time the law went into effect in 1890, it was deemed expedient to limit examinations to lieutenants and captains and this is still in force. Whatever may have been the reason for this limitation at that time, it is believed that there is no longer any good reason for excepting field officers from the test, and that the good of the service now demands that majors and lieutenant-colonels be examined physically and mentally before promotion, and that only those found qualified for promotion receive advancement.

Examination
of field officers.

As to the necessity for this examination of field officers it may be stated that while the duties of senior officers of the Coast Artillery Corps do not, as a rule, demand the immediate application of the technical detailed knowledge necessary in the junior grades, they do, however, call for a high class of both physical and mental ability, both of which are susceptible of test by a proper examination, and it is believed that only by such an examination for promotion can the best type of field officers of coast artillery be insured. An early consideration of this question is therefore recommended.

JOINT ARMY-MILITIA COAST-DEFENSE EXERCISES.

During the fiscal year 1908 and 1909 joint exercises were held in the following-named artillery districts for periods as shown:

Narragansett Bay.....	June 20 to 27, 1909.
Eastern New York.....	June 10 to 19, 1909.
Southern New York.....	June 10 to 19, 1909.
Delaware.....	August 1 to 8, 1908.
Potomac.....	July 26 to August 9, 1908.
Cape Fear.....	June 7 to 17, 1909.
Pensacola.....	October 5 to 15, 1908.
Mobile.....	April 30 to May 10, 1909.

In remaining districts where militia coast artillery companies have been or are being organized, joint exercises were held just prior to the beginning or subsequent to the end of the fiscal year above referred to. In all of the States having a militia coast artillery reserve, it is hoped that these joint exercises will be held hereafter regularly each year at such periods as are best suited to the development of the reserves.

The benefits of these joint exercises to both regular and militia coast artillery are unquestionable and marked. The War Department has published this year, as heretofore, extracts from the reports of both regular and militia officers participating in the exercises and, while progress and improvement are to be expected from year to year, an examination of these reports shows that in most of the States there is greater effort being made than ever before not only to make the most of the annual exercises, but to carry on the work in the local armories during the remainder of the year.

COAST ARTILLERY MATERIAL.

The material of our seacoast defenses may, it is thought, best be reported upon by grouping it in reference to the different localities in which it has been installed or to which it pertains, and then reporting upon that pertaining to each locality as grouped: (a) That pertaining to home ports; (b) that pertaining to insular ports; (c) that pertaining to the Isthmian Canal ports.

(a) MATERIAL OF THE HOME PORTS.

In the report of February 1, 1906, the national coast defense board, ordinarily called the "Taft Board," which designation will hereinafter be used, reported as having been expended upon home ports for our modern system of coast defense as recommended by the Endicott Board in 1886, and as necessary to complete the system with such accessories and such additional defenses as were by it considered necessary to bring the system up to date, as follows:

Expended prior to report of Taft Board, February 1, 1906.....	\$72,750,584
Estimate of Taft Board for completing defenses.....	50,879,339

Total cost..... 123,629,923

The amount, \$72,750,584, reported by the Taft Board as expended prior to February 1, 1906, should be increased by \$2,098,368,

the unallotted balances of appropriations at the time the report was submitted (guns and carriages, \$1,428,346; fire control, \$653,022; and searchlights for submarine mines, \$17,000; total, \$2,098,368), and \$7,069,564 expended for ammunition not included in the report, a total of \$9,167,932.

This increase will give as follows:

Expended prior to report of Taft Board	\$81,918,516
Estimate of Taft Board for completing defenses.....	50,879,339
Total cost.....	<u>132,797,855</u>

Since the Taft Board reported there has been appropriated for the defenses of home ports considered by that board.....	8,165,524
There has also been appropriated for the purchase of land at San Pedro, Cal., a port not considered by the Taft Board.....	250,000
Adding these amounts to the amount already appropriated.....	<u>81,918,516</u>

Gives as the total amount expended on home ports.....	90,334,040
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The amount, \$50,879,339, estimated by the Taft Board for completing the defenses of home ports, may be subdivided as follows:

(a) Estimated cost of completing defenses for which guns are now provided.....	\$22,465,970
(b) Estimated cost of completing additional defenses recommended by the board (including purchase of land for additional defenses, artificial island and breakwater in Chesapeake Bay, for experimenting with automobile torpedoes, and for cable boats).....	28,413,369
Total	<u>50,879,339</u>

For several years past it has been stated in the annual report of the Chief of Coast Artillery that the expenditures for the defenses in home ports have been mainly for guns and their emplacements, and it has been uniformly recommended that the submarine-mine equipment of these ports, and the accessories for the guns and mines already installed—fire-control apparatus, searchlights, power plants and ammunition—be provided before more guns are installed or new defense projects begun. This for the reason that, considering the present condition of the home ports, the provision of these accessories would secure the greatest measure of public safety at the least cost; and, what is more, that without these accessories the immense sum, about \$70,000,000, expended on the guns installed would be wasted, as these guns without their corresponding accessories would be of no more value in the defense of the ports in which they are mounted than so many dummies.

In consequence of these recommendations the annual estimates of the Secretary of War and the appropriations for coast defenses since the report of the Taft Board have been mainly for submarine mines and for accessories for guns and mines already installed. As it is believed that it will be to the best interests of the Government if this policy be continued, it is recommended that all estimates submitted to Congress for defenses for home ports have this in view until all the guns and mines now installed are provided with the accessories estimated for by the Taft Board.

Considering the amount.....	\$8, 165, 524
Expenditures for defenses of home ports since report of Taft Board and balance necessary to complete same.	appropriated since the report of the Taft Board for the defenses of the home ports considered by that board, there were appropriations or unexpended balances of appropriations made prior to the Taft Board which were not considered by that board, but which were or have been since devoted to projects included in the board's estimates, amounting to.....
There has been transferred from insular funds for material supplied.....	1, 483, 823 10, 725
making a total amount of.....	9, 660, 072
utilized or available for providing defenses for the home ports, since the report of the Taft Board.	
Of this total amount the following amounts have been devoted to purposes not covered by the Taft Board estimates for existing defenses:	
Guns, carriages, and emplacements.....	\$906, 825
Maintenance, etc., submarine defense.....	203, 169
Additional mine planter and equipment auxiliary planters.....	233, 400
making a total amount of.....	1, 343, 394
Deducting this amount from the total of.....	9, 660, 072
there remains.....	8, 316, 678
which has been devoted to the projects covered by the Taft Board for completing the existing defenses.	
These estimates amounted to.....	22, 465, 970
and deducting therefrom the amount.....	8, 316, 678
gives.....	14, 149, 292
as the remainder of the Taft Board estimate of the cost of completing the defenses of home ports for which guns, carriages, and emplacements were provided.	
Due to changes in the actual cost of material and construction from the cost estimated, and to an error in multiplication in the Taft Board figures, the above remainder of the board's estimate for completing the defenses of the home ports for which guns, carriages, and emplacements are provided should be increased by.....	783, 515
which gives.....	14, 932, 807
as the present estimate for completing the existing defenses of home ports.	

The amounts shown above as unallotted balances, as devoted to purposes not covered by the Taft Board estimates, and as necessary to increase the Taft Board estimates, are explained below in detail under headings relating to the different elements of existing defenses.

The following table gives for the various elements of the defenses the amounts expended for the existing defenses of home ports, the amounts required to complete these defenses, and the amounts required to provide the additional defenses recommended by the Taft Board.

Summary of appropriations for various elements of defenses of home ports.

Seacoast defenses, home ports.

	Guns, car- riages, and emplacements.	Submarine defenses.	Power plants.	Search- lights.	Fire control.	Ammun- ition.	Total.
Defenses for which guns, carriages, and emplacements are now provided: Expended previous to report of Taft Board, Jan. 25, 1896, to Feb. 1, 1906. Appropriated since report of Taft Board.....	\$64,822,843 1,399,325	\$4,935,762 2,145,000	..... \$448,888	\$900,000 755,000	\$4,190,347 2,117,311	\$7,069,564 1,300,000	\$81,918,516 8,165,524
Total cost to date.....	66,322,168	7,080,762 1,016,588	448,888 3,962,753	1,555,000 1,515,000	6,307,653 4,181,466	8,369,564 4,257,000	90,684,040 14,932,807
Required to complete.....							
Total cost completed.....	66,322,168	8,097,350 351,761	4,411,641 804,390	3,070,000 699,000	10,489,124 2,289,271	12,628,564 2,513,186	105,016,847 23,764,508
Cost of additional defenses proposed by Taft Board.....	17,126,900						
Total cost of all defenses in United States completed.....	83,449,068	8,449,111	5,216,031	3,769,000	12,758,395	15,139,750	128,781,355
Taft Board estimate for additional land for completing gun defense.....							1,493,861
Taft Board estimate for artificial island, etc., Chesapeake Bay.....							2,600,000
Taft Board estimate for experimenting with automobile torpedoes.....							50,000
Taft Board estimate of cost for four cable boats.....							506,000
Appropriated by act of Mar. 3, 1909, for land at San Pedro, Cal.....							250,000
Grand total.....							133,680,216

The amount, \$8,415,524, appropriated for the defenses of home ports since the Taft Board reported, is itemized as follows:

	Act June 25, 1906.	Act Mar. 2, 1907.	Act May 27, 1908.	Act Mar. 3, 1909.	Totals.	
Batteries:						
(a) For emplacements.....			\$300,000	\$5,064	\$305,064	
(b) For modernizing em- placements.....	\$150,000	\$100,000	165,261	100,000	515,261	
(c) For guns and carriages..	174,000	132,000	273,000	.....	579,000	\$1,399,325
Submarine defenses:						
(d) For mine structures....	175,000	175,000	175,000	100,000	625,000	
(e) For mine material.....	300,000	250,000	310,000	310,000	1,170,000	
(f) For mine planters.....	.....	175,000	175,000	.....	350,000	2,145,000
(g) For power plants.....	.....	.....	348,888	100,000	448,888	
(h) For searchlights.....	125,000	210,000	210,000	210,000	755,000	755,000
(i) For fire control.....	700,000	900,000	270,256	247,055	2,117,311	2,117,311
(j) For ammunition.....	325,000	325,000	325,000	325,000	1,300,000	1,300,000
	1,949,000	2,267,000	2,552,405	1,397,119	8,165,524	8,165,524
For the defense of San Pedro, Cal., a port not recommended by the Taft Board.....					250,000	
						8,415,524

The existing condition of the defenses of the home ports for which guns, carriages, and emplacements are now provided, so far as relates to the different elements itemized above, is as follows:

The amount appropriated for emplacements, guns, and carriages
Emplacements, for the defenses of home ports since the report of
guns, and carriages. the Taft Board is—

Emplacements:		
(a) New battery, Puget Sound.....	\$300,000	
(b) Remodeling old battery.....	5,064	
		\$305,064
Modernizing emplacements.....		515,261
Guns and carriages:		
(a) New battery, Puget Sound.....	273,000	
(b) Completing 15-pounders authorized prior to report of Taft Board.....	174,000	
(c) Construction type 14-inch gun.....	132,000	
		579,000
Total.....		1,399,325

The two items, \$300,000 for new emplacements and \$273,000 for new guns and carriages, total \$573,000, should be deducted from the estimate....	17,699,000
of the Taft Board for guns and emplacements for additional defenses— subtracting this amount.....	573,000
leaves	17,126,000
as the Taft Board estimate for guns and emplacements for addi- tional defenses yet to be appropriated for.	

The estimate of the Taft Board for modernizing older emplace-
ments was \$492,500. The work contemplated by this estimate con-
sisted only in the widening of the platforms. It did not include the
installation of powder hoists and other essential modifications, so that
while the appropriations for this purpose to date, \$515,261, exceed
the estimates, the work is still only partially completed. Detailed
estimates for the work have been prepared by the Chief of Engineers
which show that one and a half million dollars, in round numbers, is
still required to bring the older batteries of large-caliber guns up to
the standard of efficiency secured by the latest type of emplacement.

The estimate of the Taft Board for completing the mine defense of home ports was..... \$3, 889, 993

Submarine mine defenses From this amount the following items since included in other estimates should be deducted:

For searchlights for mine fields	\$669, 000	
For mine planters and other boats.....	279, 000	
For fire-control apparatus.....	15, 522	
		<u>963, 522</u>

This leaves..... 2, 926, 471
as a revised estimate for completing the submarine mine defenses of home ports.

Of this \$2,926,471, \$864,623 relates to *submarine mine structures* under the Engineer Department and \$2,061,848 to *submarine mine material* under the Ordnance Department.

Considering the estimate.....	\$864, 623	
for completing submarine mine structures of home ports there has been appropriated for mine structures since the report of the Taft Board.....	\$625, 000	
This amount should be reduced by	65, 141	
for excess in cost of structures built over estimates.....		<u>559, 859</u>

This leaves..... 304, 764

This amount, \$304,764, may be itemized as follows:

For structures at constructed defenses of home ports.....	\$236, 764
For structures for additional defenses for Chesapeake Bay..	68, 000

Total.....	304, 764
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Considering the estimate..... 2, 061, 848

for submarine mine material for home ports, there has been appropriated for mine material since the Taft Board reported..... \$1, 170, 000. 00

which should be increased by—

Appropriations prior to Taft Board.....	30, 800. 80
Cost of mine cases supplied insular ports.....	10, 725. 00
Savings in purchase over estimate.....	13, 989. 00

\$1, 225, 514. 80

and reduced by—

Cost of maintenance of mine equipment.....	165, 284. 78
Cost of torpedo depot administration.....	37, 884. 61
Cost of contingencies.....	682. 41
Cost of equipment of auxiliary mine planters.....	23, 400. 00

227, 251. 80

998, 263

This leaves..... 1, 063, 585
as the estimate for completing mine material of home ports.

This amount, \$1,063,585, may be itemized as follows:

For material for constructed defenses of home ports.....	779, 824
For material for additional defenses for Chesapeake Bay.....	283, 761

Total.....	1, 063, 585
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Regarding submarine mines and the necessity for completing this important element of the defense of our home ports, it has been stated by me in a former annual report that—

Recent war has clearly shown the value of submarine mines as an element of harbor defense. If a harbor is defended by an efficient system of mines and the requisite

guns for their protection against countermining, sweeping, or other methods of removing them, it is not believed that any enemy, however enterprising, will ever attempt to force an entrance into a harbor with large ships. * * * Our system of submarine mines is practically perfect as a war weapon. * * * When it is considered that if the mine defense of the country is completed the navy would be comparatively free to perform its true function of seeking the enemy at sea, unhampered by the thought of poorly protected harbors at home, it will be apparent that this completion should be accomplished at the earliest possible moment.

More than this, we can not afford to wait for war before completing our mine defense, but must be prepared beforehand; for unless we are thus prepared no amount of money made available at the outbreak of war could procure mine material in time to be of service in mine defense against an active, enterprising enemy. Essential parts of this material, such as the cables, mine cases, and electrical apparatus, can not be bought in open market, but must be manufactured to order, and after having been ordered it requires months to fill the orders.

If confronted suddenly by war, only such material as is on hand can be utilized for immediate mine defense, and if any essential part of the mine system is lacking, the whole mine defense must fail. * * * The complete mine equipment of every harbor to be mined should be kept on hand ready to be planted, and it should be made possible to mine effectively every harbor within forty-eight hours.

Since the above extract was written Congress has authorized the requisite personnel to efficiently handle the mine defense of every fortified home port, and the requisite boats for planting the mines have been provided from appropriations and through the courtesy of the Quartermaster's Department and of the Secretary of the Navy and of the Secretary of Commerce and Labor. The personnel being trained, the boats for planting the mines provided, it only remains to complete a comparatively few mine structures and provide a comparatively small quantity of mine material to complete the submarine mine defense of every home port.

It is therefore most earnestly recommended that the amount, \$236,764, necessary for completing the mine structures of home ports and the amount, \$779,824, necessary to provide the remainder of the mine material for the defense of every fortified home port from Portland, Me., to Galveston, Tex., and from San Diego, Cal., to Seattle, Wash.—a total amount of \$1,016,588, or about one-tenth of the cost of a modern battle ship—be appropriated without delay.

Since the above remarks regarding the completion of the submarine mine defenses of our home ports were written, a report has been received from a board of coast artillery officers which had been specially selected by the War Department for the purpose of making experiments as to the practicability of effectually mining the swift and deep waters of the "race" at the eastern entrance to Long Island Sound. The report of the board was therefore received after the close of the fiscal year covered by this report, but the result of the experiments by the board in this most difficult piece of mine work was so satisfactory and of such vital interest in the defense of these waters in case of war that it is thought to be to the best interests of the service to give here an extract from the board's report on its excellent work.

Before quoting from the report, it may be well to state for the information of those who would not otherwise appreciate the difficulties connected with successfully mining the locality that for many years it was generally considered by army and navy officers that it was not possible to effectively mine the "race," owing to its enormous current and very great depth.

Solution of the important submarine mining problem at eastern entrance to Long Island Sound.

In 1902, however, after considerable practical experience in mining waters contiguous to the eastern entrance to the sound during the joint army and navy exercises of that year, I became convinced that it would be practicable to mine effectively all waters of the entrance except possibly the deepest part of the "race," and that it might be even possible to effectively mine this with specially designed material. The general estimates for completing the submarine mine equipment of our home ports, prepared by me, as commandant of the School of Submarine Defense in 1904, therefore included a mine equipment for the entire eastern entrance to Long Island Sound, which included the "race." Since those estimates were submitted there has been a constant endeavor on my part, as well as on that of all other coast artillery officers especially interested in the development of our submarine-mine system, to develop such special mine material as would enable us to successfully mine the "race" and other deep and swift waters in our fortified harbors.

In making its experiments the board made use of one of the four new army mine planters, specially adapted to such work; without such a boat equipment the experiments would have been exceedingly difficult.

The work of the board is thus reported:

1. We located the central portion of the proposed mine field for the eastern entrance of Long Island Sound and found that the water was approximately 125 feet deep. A group of mines was planted successfully, the captain of the planter being able to pass the distribution box boat with comparative facility, though the current was running strong enough to tow under the ordinary keg buoys. After it was evident that the single keg would be towed under, two kegs were used for buoys. The group of mines was planted with almost the same ease as the outside harbor at this post [Fort Monroe]. The time for the 1,500-pound anchor to reach the bottom was approximately eight seconds.

2. We then proceeded to a point about half a mile from the narrowest point of the race on the outside where the water was 200 feet deep. The mines were planted successfully at this point with little more difficulty than the preceding locality, the submergence obtained being satisfactory. The current was swift and there was some difficulty in passing the distribution box boat on the starboard hand. However, the planting was a perfectly feasible operation. The time for the 1,500-pound anchor to reach the bottom was approximately sixteen seconds.

3. Then we located the deepest water (about 300 feet) in the region a short distance from the race proper on the inside and somewhat nearer to Little Gull than Race Light. Mines were planted there and the anchors functioned with the same facility as in shallower water; 32-inch mine cases were used as buoys, and the time for the anchor to descend was 24 seconds.

4. From the foregoing experiments the board concludes:

(1) That the waters at the eastern entrance to Long Island Sound may be mined with very slightly more difficulty than the outside harbor at this post [Fort Monroe, Va.].

(2) That the rate of descent of the anchor is approximately uniform, independent of the depth * * * and that an efficient mine defense of any harbor will depend solely on having heavy enough anchors to insure no shifting after the mines are down.

* * * * *

5. The water was very clear, and the mine cases 8 or 10 feet below the surface could be seen from the planter when it was alongside of them. Their depression with the tide currents encountered was not very material, No. 38 cases being the ones used.

6. From conversation with some of the officers at Fort Wright the board found that some mine cases planted with small anchors in shallow water near the edge of the mine field had been shifted by the swift tide. This was readily accounted for, as very small anchors had been used.

The question of effectively mining the "race" has been thus definitely settled, and one of the most difficult problems connected with the defense of the eastern entrance to Long Island Sound thereby solved. The submarine-mine equipment required by the approved

project for the eastern entrance to Long Island Sound is now being supplied, and in a short while this important entrance to New York will be completely equipped with this element of defense.

In certain localities, as at Admiralty Inlet, Washington, it is not practicable to install the mines for an efficient defense; in some others, as the entrance to Chesapeake Bay, the guns necessary for the protection of the mine fields are not yet installed; and in still others the mine defense although installed should be supplemented, owing to peculiar conditions incident to the locality, as the entrance to San Francisco Bay and the eastern entrance to Long Island Sound.

In each case recourse is best had to the automobile torpedo as carried by the submarine.

The development of the submarine boat has progressed so rapidly during the past few years, its position as an effective weapon of offense and defense has become so well established, and its defects and limitations are so well recognized that no better weapon can be employed as an adjunct to both gun and mine defense in the localities indicated, where, owing to the great width of the channel, rough and deep water, and swift currents, the mines either can not be planted or must be supplemented by other means of submarine defense.

In this connection it should be stated that this opinion is not a new one. As long ago as 1903-4 I made a similar recommendation in my annual report as commandant of the School of Submarine Defense, and with the development of the submarine boat since that time this opinion has been strengthened and corroborated. Attention is invited to the following extract from the report referred to:

It is now again desired to invite special attention to the unquestionable value of submarine boats as an adjunct to fixed mines * * * for the defense of the particular places named * * *. The advisability of procuring submarine boats for the defense of the places named it is believed will also seem to be unquestionable when it is considered that the cost of such a boat is about one-fortieth of that of a modern battleship; that without such boats as an adjunct to the mine and gun defenses of those places a more expensive boat of the navy will undoubtedly be called for as a home guard for those waters in case of war * * *.

Submarines for harbor defense should be purchased and operated by the Navy Department. They should, however, be assigned to the particular locality and should be left there, for they should form an integral part of the local defense, and so long as this defense is needed they should be as much a part of it as the guns in the batteries on the shore.

It is therefore recommended that submarines be hereafter regarded as an essential part of the defense of Admiralty Inlet, San Francisco, Chesapeake Bay, and the eastern entrance to Long Island Sound, that at least one boat be assigned permanently to each place, and that measures be taken by the Navy Department at an early date to carry this into effect.

The estimate of the Taft Board for power plants for the defenses of home ports is itemized as follows:

Power plants.		
Central plants for existing defenses.....	\$2, 501, 182	
Reserve plants for existing defenses.....	1, 910, 459	
		\$4, 411, 641
Central plants for additional defenses.....	561, 482	
Reserve plants for additional defenses.....	242, 908	
		804, 390
Total cost.....		5, 216, 031

The urgency of the need of more electric power and light in coast defenses was indicated in the report of the Taft Board and has been repeatedly indicated in former annual reports of the Chief of Coast Artillery. Notwithstanding this fact, there has been appropriated for power plants for home ports since the Taft Board made its recommendations regarding the providing of these plants but \$448,888, or a trifle more than one-sixth of the amount estimated by the board for central plants for existing batteries alone.

It is therefore evident that our home ports are woefully lacking in this important adjunct to their defenses, and it is again most earnestly recommended that Congress be urged to make more liberal appropriations for these plants.

The appropriation carried by the act of May 27, 1908, amounting to \$348,888, was expended in providing central plants for Forts Casey, Stevens, Barry, Baker, and Winfield Scott.

The appropriation carried by the act of March 3, 1909, amounting to \$100,000, was expended in procuring 15 25-kilowatt gasoline sets, which are being installed at the following forts: Rodman, 1; Michie, 1; Terry, 3; Constitution, 1; Foster, 1; Du Pont, 1; Armistead, 1; Moultrie, 1; Dade, 1; Canby, 1; and Taylor, 3.

By the latter course it was possible to provide best for the greatest number of places having the most pressing needs.

The following table gives, for the home forts, the capacity of the central plants now installed, the additional power needed for existing defenses, and the cost of the latter:

Central plants for existing batteries for home forts.

Forts.	Capacity in kilo- watts of plants now installed.	Capacity in kilo- watts of additional power re- quired.	Cost of ad- ditional power as estimated by Taft Board.
Popham, Me.....		15	\$3,590
Lyon, Me.....		5	3,120
McKinley, Me.....	150	30	7,313
Levett, Me.....	150	40	9,001
Preble, Me.....	13	35	36,391
Williams, Me.....	100		
Foster, Me.....		50	47,414
Stark, Me.....		25	4,909
Constitution, N. H.....		25	34,618
Heath, Mass.....	10	50	16,115
Banks, Mass.....	7	15	3,590
Strong, Mass.....	85		
Standish, Mass.....	7	100	58,872
Warren, Mass.....	150		
Andrews, Mass.....	20	35	31,801
Revere, Mass.....	15	50	25,355
Rodman, Mass.....	11	35	43,129
Adams, R. I.....	120		49,500
Wetherill, R. I.....	7	100	104,978
Getty, R. I.....		50	60,258
Greble, R. I.....	60		
Kearny, R. I.....		25	5,074
Sakonnet River, R. I.....			
Mansfield, R. I.....		50	50,795
H. O. Wright, N. Y.....	75		
Michie, N. Y.....	52	70	74,861
Terry, N. Y.....	48	50	80,322
Tyler, N. Y.....			4,909
Gardiners Island.....			
Slocum, N. Y.....	5	35	28,414
Schuyler, N. Y.....	75	70	27,500
Totten, N. Y.....	100	100	53,178
Wadsworth, N. Y.....	198	35	11,550
Hamilton, N. Y.....	212	35	11,550

Central plants for existing batteries for home forts—Continued.

Forts.	Capacity in kilo- watts of plants now installed.	Capacity in kilo- watts of additional power re- quired.	Cost of ad- ditional power as estimated by Taft Board.
Hancock, N. J.	197		
Camp Low			
Princess Bay			
Delaware, Del.	32	25	\$4,909
Mott, N. J.	60	100	44,946
Du Pont, Del.	40	50	45,362
Howard, Md.	87	70	42,942
Smallwood, Md.	47	15	3,590
Carroll, Md.	22	25	4,909
Armistead, Md.	21	25	4,909
Cape Henry, Va.			
Middle Point, Va.			
Cape Charles, Va.			
Monroe, Va.	120	200	113,919
Wool, Va.			
Washington, Md.	153		
Hunt, Va.	70	35	52,099
Caswell, N. C.	27	100	53,206
Sumter, S. C.	10	15	3,590
Moultrie (east), S. C.	10	70	7,150
Moultrie (west), S. C.	10	70	66,881
Screven, Ga.	7	100	96,345
Pulaski, Ga.		5	2,487
Taylor, Fla.	25	100	64,989
Dade, Fla.	20	100	55,673
De Soto, Fla.		15	3,590
Pickens, Fla.	98	100	52,368
McRee, Fla.	30	25	4,909
Barrancas, Fla.			
Santa Rosa, Fla.			
Morgan, Ala.	70	100	73,931
Gaines, Ala.	20	15	3,590
St. Philip, La.	60	70	55,432
Jackson, La.	60	25	4,909
San Jacinto, Tex.		35	53,684
Travis, Tex.		25	4,909
Crockett, Tex.		35	31,330
Rosecrans, Cal.	60	50	17,358
North Island, Cal.			
Miley, Cal.	30	50	44,452
Scott, Cal.	256		
Mason, Cal.	3	15	3,590
McDowell, Cal.	9	25	35,234
Baker, Cal.	53		
Barry, Cal.	50		
Stevens, Oreg.	110		
Columbia, Wash.	28	35	51,200
Canby, Wash.		20	6,078
Worden, Wash.	225	150	50,000
Flagler, Wash.	235	150	50,000
Casey, Wash.	170		
Middle Point, Wash.		15	3,590
Ward, Wash.		50	46,127
Foulweather Bluff, Wash.			
Double Bluff, Wash.			
Deception Pass, Wash.			
Agate Passage, Wash.			
Total	4,195	3,240	2,152,294

The estimate of the Taft Board for searchlights for the gun defense of home ports, constructed and proposed, was \$2,897,700

Searchlights. This amount must be increased by the amount..... 669,000
estimated by the board for mine lights which was carried in the report of the board in its estimate for submarine defenses, but which has since been subtracted from that item and added to the board's estimate for gun lights.

This amount must also be increased by 186,300
owing to a typographical error in the board's estimate for gun lights for Boston Harbor.

And also increased by.....	\$16,000
owing to an error in the board's estimate for mine lights.	
The corrected estimate for searchlights for both gun and mine defense of home ports is therefore.....	3,769,000
Of this amount (\$3,769,000).....	699,000
was estimated for searchlights for additional defenses.	
Subtracting, there remains.....	3,070,000
as the estimate for lights for existing defenses.	
This amount has been reduced by.....	\$800,000
appropriated for searchlights prior to the report of the board,	
and by.....	755,000
appropriated since the board reported.	
	1,555,000
There then remains.....	1,515,000
as the estimate for completing the searchlight equipment of existing defenses in home ports, which amount is about one-half of the original estimate for these lights; or the searchlight equipment of home ports is therefore about one-half completed.	

The total estimate of \$3,769,000 contemplates providing 155 60-inch lights at \$17,000 each, and 126 36-inch lights at \$9,000 each. Of these 60-inch and 36-inch lights, 39 60-inch and 4 36-inch lights were intended for additional defenses, and 116 60-inch and 122 36-inch lights were for existing defenses.

There have been purchased to date from the appropriations of \$1,555,000 already made, 65 60-inch and 52 36-inch lights,^a the estimated cost of which lights was \$1,573,000. This leaves 51 60-inch and 70 36-inch lights yet to be purchased. Estimating the cost of the 60-inch lights at \$17,000 each and the 36-inch at \$9,000, the amount required to complete the searchlight equipment of home ports is \$1,497,000, or \$18,000 less than estimated above.

During the past year a skilled coast-artillery officer, specially selected for the work, completed a series of experiments in the most important of the fortified home ports on the Atlantic, Pacific, and Gulf coasts, with a view to determining as far as possible by actual trial the actual number of searchlights needed for both gun and mine defense in each of the posts visited, and also the best locations for the lights needed. In making these experiments portable 36-inch lights were used, and as a result of the experiments a number of questions as to the most advantageous positions of the lights in reference to the armament and to each other were satisfactorily settled.

Attention must again be called to the importance of providing the one-half of the searchlights still needed for the existing defenses of home ports; they are absolutely necessary for disclosing the presence of an enemy's ships in case of a night attack on a fortified harbor. With them the ships may be so illuminated as to render the work of the position finding-system and the dependent defense of the harbor almost as efficient at night as during day; without them the gun defenses are practically powerless at night, and a run-by could then be prevented only by the mines, which could be removed with comparative ease if their fields were not illuminated so that they could be defended by the guns.

^a Besides these 60-inch and 36-inch lights a number of lights smaller than 36-inch were purchased, which are now of practically no value for either gun or mine defense work.

The estimate of the Taft Board for fire control for the defenses of home ports, constructed and proposed, was.....		\$9, 463, 053
Fire control.	Of this amount there was estimated for additional defenses.....	2, 269, 271
Leaving for defenses constructed or appropriated for.....		7, 193, 782
This amount has been reduced by.....		\$653, 022
an unallotted balance from appropriation for fire control prior to the report of the Taft Board,		
and by.....		2, 117, 311
appropriated since the board reported,		
and also by.....		241, 983
savings made on actual cost of construction and installation over estimates.		
		3, 012, 316
There then remains		4, 181, 466
as the estimate for completing the fire-control equipment of existing defenses in home ports, which amount is a little more than half the original estimate of the Taft Board for fire control; or the fire control equipment for the existing defenses of home ports is not quite half completed.		

With the amounts heretofore appropriated what is known as the "Standard Fire Control System" has been or is being installed in the harbors of Portland, Boston, New York, Puget Sound, San Francisco, and the Columbia River, and the "provisional system" in the remaining fortified home ports.

The "Standard Fire Control System," as embodied in the type installation of 1909, is efficient and satisfactory. The precision of fire-control instruments has recently been so increased that the probable error in their observations is well within the probable error of the guns, and a degree of certainty and directness in the transmission of fire-control data has been reached which at one time seemed almost impossible of accomplishment. There can now be no doubt in the mind of anyone conversant with the standard system of its accuracy, of the permanence of its essential features, or of what would be its value in case of war.

The "provisional systems" have been established for all batteries that are manned in home ports other than those in which the standard system has been installed. These provisional systems were established in accordance with War Department orders of January, 1906, for the following object:

In order that each battery in commission may be provided with a temporary system of fire control sufficient for drill and artillery practice, pending the final installation of the permanent system.

These provisional installations having been established at different times, and from means available, are not uniform in type, part being according to the latest improved plans and type and others of obsolete plans and type. They provide, however, a means by which all the regular coast artillery garrisoning the ports wherein they are installed, as well as the militia coast artillery reserves for those ports can be instructed in fire-control apparatus and work. The material of these provisional systems will be utilized as far as practicable in the installation of standard systems when funds for the latter are available. Some of the provisional systems will be of little value in making standard installations, but others by the addition of possibly 20 per cent of new standard material may be fully changed into the standard systems. The main difference between the standard and

the provisional system is that in the former the lines of communication are underground cables fully protected, while in the latter the lines are overhead wires; besides this the material of important links in the provisional system is temporary, and not adapted to or suitable for war conditions.

Not only are these provisional systems as improvised not adapted to war conditions, but, as has been already shown, they have been installed only in batteries that can be manned with the authorized coast artillery personnel in home ports other than those in which standard systems have been provided.

When it is remembered that the value of a gun or mortar of given caliber and power is dependent upon its hitting capacity alone; that at long and mid ranges the hitting capacity of a gun may be more than quadrupled by the substitution of an accurate fire-control system for an obsolete system; that our standard system is exceedingly accurate and most satisfactory, and that without a fire-control system the mortar, one of the valuable elements of coast defense if efficiently handled, is absolutely worthless, the necessity for the prompt completion of the standard fire-control installation for all guns and mortars already mounted in our home ports, and not provided with any system of fire control whatever, becomes strikingly evident.

The estimated cost for completing the fire-control equipment of existing defenses in home ports is, as above shown, \$4,181,466. The existing gun and mortar defenses in these home ports have, as already stated, cost about \$70,000,000; and as also already stated, a large number of batteries have no fire-control system whatever. In case of war, therefore, unless some system of directing the fire of these gun and mortar batteries, already existing and without means of directing their fire, is provided, a seriously large percentage of the \$70,000,000 expended on gun and mortar batteries in home ports will have been wasted.

The amounts required to complete the fire-control installations of home ports are indicated in the following table:

Taft Board estimates for fire control for existing defenses in home ports.

Ports.	Amount re- quired for engineer work.	Amount re- quired for signal corps work.	Amount re- quired for ordnance work.	Total amount required.
Kennebec River		\$3,200		\$3,200
Portsmouth	\$88,773	41,700	\$10,000	140,473
New Bedford	155,050	16,000	10,000	181,050
Narragansett Bay	438,500	124,000	10,000	572,500
New London	98,089	125,100		a 223,189
Delaware River	138,510	89,600	10,000	238,110
Baltimore	252,097		10,000	262,097
Hampton Roads	296,114		10,000	306,114
Potomac River	44,866		10,000	54,866
Cape Fear River	120,801	41,600	10,000	172,401
Charleston	117,925	64,000	10,000	191,925
Savannah	128,752	51,200	10,000	189,952
Key West	216,782	54,400	10,000	281,182
Tampa	201,743	38,490	10,000	250,143
Pensacola	159,457	51,600	10,000	218,057
Mobile	324,277	44,600	10,000	388,877
Mississippi River	105,840	44,800	10,000	160,640
Galveston	192,255	44,800	10,000	247,055
San Diego	77,235	22,400		99,635
Total	3,164,066	857,400	169,000	4,181,466

^a Estimate to complete. Total estimate \$397,244, of which \$174,055 was provided from appropriation of March 3, 1909.

The estimate of the Taft Board for reserve ammunition for all guns, constructed and proposed, in home ports was.....		\$6, 571, 301
Ammunition.	The amount should be increased by.....	\$1, 582, 000
due to the cost of certain items which were not considered in the estimate of the board;		
and should be decreased by.....		83, 115
on account of the decreased cost of certain components of the ammunition,		
making a net increase of.....		1, 498, 885
This gives.....		8, 070, 186
as the revised estimate for reserve ammunition for all guns, constructed and proposed, in home ports.		
Of this amount there is estimated for reserve ammunition for additional batteries.....		\$2, 513, 186
And there has been appropriated since the report of the Taft Board.....		1, 300, 000
		3, 813, 186
Subtracting these amounts there remains.....		4, 257, 000
as the estimate for reserve ammunition to complete the supply for all existing batteries in home ports.		

For the past four years the annual appropriation for reserve ammunition for home ports has been \$325,000. If appropriations are continued at this rate, it will require thirteen years to complete the full supply of reserve ammunition for all batteries now constructed in home ports, and eight years more, or twenty-one years in all, to complete this supply of ammunition for all batteries constructed and proposed in home ports.

As to the value of guns without ammunition no remarks are necessary.

(b) MATERIAL OF THE INSULAR PORTS.

In its report of February 1, 1906, the Taft Board reported as having been expended upon the seacoast defenses of the insular ports, and as necessary to complete the defenses of these ports, as follows:

Expenditures for defenses of insular possessions prior to Feb. 1, 1906, and Taft Board's estimate to complete same.	Appropriated prior to report of Taft Board, Feb. 1, 1906.	\$2, 254, 920
	Cost of 13 12-inch guns, paid for from appropriations previously made for guns, mortars, and carriages for home ports and not required therein.....	565, 045
Cost of 5 10-inch guns, paid for from appropriations previously made for guns, mortars, and carriages for home ports and not required therein..		142, 500
Estimate of Taft Board for completing defenses of insular ports.....		19, 873, 895
Total cost.....		22, 836, 360

The amount, \$2,254,920, reported by the Taft Board as having been appropriated prior to February 1, 1906, should be increased by \$150,000, the amount which was on hand and unallotted on that date for submarine-mine material and which was not included in the figures given in the report, making the correct amount appropriated prior to the report of the Taft Board \$2,404,920.

Making this increase we have—

Appropriated prior to report of Taft Board.....	\$2, 404, 920
Cost of 13 12-inch and 5 10-inch guns, paid for from appropriations previously made for guns, mortars, and carriages for home ports and not required therein.....	707, 545
Estimate of Taft Board for completing defenses of insular ports.....	19, 873, 895
Total cost.....	22, 986, 360
Considering the amount.....	19, 873, 895
estimated by the Taft Board for completing the defenses of the insular ports, this amount should be decreased by.....	9, 216, 052
the amount appropriated since the Taft Board reported, leaving.....	10, 657, 843
as the Taft Board estimated cost of completing the defenses of the insular ports.	
This estimate should be increased by.....	\$414, 085
for increased cost of guns and carriages due largely to revision of projects of Taft Board for certain localities;	
and by.....	326, 600
for increased cost of searchlights, due to increase in number estimated for, increased cost per light, and transfer of mine lights from heading "Submarine mine defense," where they were carried by the Taft Board to this heading;	
and by.....	737, 712
for increased cost of ammunition, due to error in estimates of the Taft Board as to cost of ammunition.	
Total increase.....	1, 478, 397
and decreased by.....	133, 270
for decreased cost of gun and mortar batteries;	
and by.....	66, 931
for decreased cost of power plants;	
and by.....	250, 133
for decreased cost of fire-control installation;	
and by.....	117
for decreased cost of submarine mine installation.	
Total decrease.....	450, 451
making the amount by which the estimate of the Taft Board should be increased.....	1, 027, 946
and the revised estimate of cost of completing the defenses recommended by the Taft Board for all insular ports.....	11, 685, 789
Of this amount there is required for completing the defenses of Guantamano, San Juan, Kiska Island, and Guam.....	6, 700, 455
leaving.....	4, 985, 334
as the amount required to complete the defenses of Manila and Subic Bays, Honolulu, and Pearl Harbor.	

The following table gives in detail the amounts expended for the existing defenses of the insular ports, the amounts required to complete the additional defenses recommended by the Taft Board, and the total estimated cost of all defenses, provided and projected, for the the insular ports:

Seacoast defenses, insular ports.

	Guns, carriages, emplacements, and sites.	Submarine defense.	Power plants.	Searchlights.	Fire control.	Ammunition.	Total.
Expended prior to report of Taft Board.....	\$2, 138, 920	\$150, 000	.....	.....	\$16, 000	\$100, 000	\$2, 404, 920
Cost of thirteen 12-inch and five 10-inch guns, paid for from appropriation made prior to report of Taft Board for guns, mortars, and carriages for the United States and not required therein.....	707, 545	.....	.....	.....	.....	.....	707, 545
Expended since report of Taft Board.....	5, 869, 200	1, 260, 060	\$238, 292	\$323, 500	625, 000	900, 000	9, 216, 052
Total cost to date.....	8, 715, 665	1, 410, 060	238, 292	323, 500	641, 000	1, 000, 000	12, 328, 517
Remaining to be appropriated to complete the defenses recommended by the Taft Board....	6, 344, 600	507, 463	483, 490	592, 100	1, 020, 424	2, 737, 712	11, 685, 789
Revised estimate of total cost of all defenses, provided and projected, of insular ports....	15, 060, 265	1, 917, 523	721, 782	915, 600	1, 661, 424	3, 737, 712	24, 014, 306

The amount, \$9,216,052, appropriated for the defenses of the insular ports since the Taft Board reported is itemized as follows:

	Act June 25, 1906.	Act March 2, 1907.	Act May 27, 1908.	Act March 3, 1909.	Totals.	
Batteries:						
(a) For emplacements.....	\$410, 000	\$700, 000	\$1, 359, 000	\$1, 349, 200	\$3, 818, 200	
(b) For guns and carriages.....	400, 000	400, 000	704, 000	547, 000	2, 051, 000	\$5, 869, 200
Submarine defenses:						
(c) For mine structures.....	.....	200, 000	129, 000	.....	329, 000	
(d) For mine material.....	.....	205, 440	351, 620	.....	557, 060	
(e) For mine planters and launches.....	.....	.....	374, 000	.....	374, 000	1, 260, 060
(f) For power plants.....	.....	.....	135, 000	103, 292	238, 292	238, 292
(g) For searchlights.....	.....	30, 000	227, 500	66, 000	323, 500	323, 500
(h) For fire control.....	32, 000	100, 000	243, 000	250, 000	625, 000	625, 000
(i) For ammunition.....	100, 000	50, 000	250, 000	500, 000	900, 000	900, 000
Total.....	942, 000	1, 685, 440	3, 773, 120	2, 815, 492	9, 216, 052	9, 216, 052

The present condition of the defenses of the insular ports, considering separately the different elements itemized above, is as follows:

The estimate of the Taft Board for emplacements for the insular ports was.. \$7, 515, 670
 Emplacements. Of this amount..... 2, 133, 000
 was estimated for emplacements for Guantanamo, San Juan, Guam, and Kiska Island.

Subtracting there remains 5, 382, 670
 as the estimate of the Taft Board for emplacements for Manila and Subic Bays, Honolulu and Pearl Harbor.

This amount has been reduced by.....	\$3, 818, 200
appropriated since the report of the Taft Board.	
and also by.....	133, 270
savings made to date on actual cost of construction over estimates.	<u> </u>
	\$3, 951, 470

There thus remains	1, 431, 200
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as the estimate for completing the emplacements for Manila Bay and Pearl Harbor—all emplacements for Subic Bay and Honolulu having been completed from the amounts heretofore appropriated.

An estimate for that part of this amount (\$1,431,200) needed to complete the emplacements for Manila Bay—

For completion of engineer work on El Fraile Island....	\$450, 000
For completion of engineer work on Carabao Island.....	100, 000
For projected emplacements on Caballo Island.....	<u>769, 000</u>

1, 319, 000

will be submitted to Congress this year.

This leaves	112, 200
for completing the emplacements for Pearl Harbor to be estimated for in future.	

From this it is seen that past appropriations for emplacements in the insular possessions have been sufficient to complete the emplacements for Honolulu and Subic Bay and the greater part of the work for Manila Bay and Pearl Harbor, or about 70 per cent of the total work required at the four localities mentioned. Of the remaining work to be done, that for Manila Bay is the most urgent. While the greater part of the emplacements and armament for Manila Bay has already been appropriated for, this can be but partially effective, and in war may be found wholly wanting, without the projected defenses for El Fraile and Caballo Islands.

The work of fortifying El Fraile Island is now in progress, under the authority contained in the fortification act of March 3, 1909, which act contained also an appropriation for beginning the work; but nothing has yet been appropriated for the projected defenses on Caballo Island. The necessity for completing the projected defenses on both El Fraile and Caballo Islands is so pressing that I earnestly recommend that the War Department urge Congress to appropriate, at its next session, for the completion of the projected defenses for both these islands.

The estimate of the Taft Board for guns and carriages for the insular ports was.....	\$4, 417, 315
Guns and car- Of this amount.....	1, 346, 800
riages. was estimated for guns and carriages for Guantanamo, San Juan, Guam, and Kiska Island.	<u> </u>
Subtracting there remains	3, 070, 515
as the estimate of the Taft Board for guns and carriages for Manila and Subic Bays, Honolulu and Pearl Harbor.	
This amount has been reduced by.....	\$2, 051, 000
appropriated since the report of the Taft Board,	
and increased by	414, 085
on account of increase in actual cost of construction over estimates.	<u> </u>

Or a net reduction of	1, 636, 915
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Subtracting there remains	1, 433, 600
as the estimate for completing the guns and carriages for Manila Bay and Pearl Harbor—all guns and carriages for Subic Bay and Honolulu having been covered by past appropriations.	

An estimate for that part of this amount (\$1,433,600) needed to complete the guns and carriages for Manila Bay—

For completion of guns and carriages for El Fraile Island..	\$335, 400
For completion of turrets for El Fraile Island	624, 800
For projected guns and carriages for Caballo Island.....	372, 200
For cost of tools and inspection.....	17, 600
	<hr/> \$1, 350, 000

will be submitted to Congress this year.

This leaves.....	83, 600
for completing the projected guns and carriages for Pearl Harbor to be estimated for in future.	

The estimate of \$1,350,000 for guns, carriages, and turrets, for Manila Bay, to be submitted to Congress this year, covers the armament to be installed in the emplacements for which, as explained on page 37, an estimate of \$1,319,000 will be submitted to Congress, and the remarks as to the urgent need of these emplacements obviously apply with equal force to these guns, carriages, and turrets.

The estimates for the fortification of El Fraile Island submitted to Congress at its last session contemplated that the armament for El Fraile Island. two turrets included in the plan of fortification should be of the naval type, the cost of their manufacture being estimated at \$400,000. In accordance with this estimate and under the appropriation and authorization contained in the fortification act of March 3, 1909, the War Department allotted to the Chief of Ordnance for the manufacture of these turrets, \$250,000 cash and a contract authorization of \$150,000. Subsequent study of the subject, however, showed conclusively that it is advisable to make these turrets larger and much more heavily armored than the naval type of turret, and, this view of the matter having been approved by the War Department, the Chief of Ordnance has designed a type of turret at an estimated cost for manufacture for the two to be installed on El Fraile Island of \$874,800, or an increase over the original estimate based on the naval type of turret of \$474,800. As the cash allotment for the manufacture of these turrets from the appropriation of last year was \$250,000, there remains to be estimated for this year, to complete the manufacture of these turrets, \$624,800. The advantages for seacoast defenses of the type of turret designed by the Chief of Ordnance over the naval type of turret are so marked that the increased expenditure involved is well warranted. It should be noted, in this connection, that while the increased cost of these turrets, \$474,800, over the naval type of turret appears large, it is less than 22 per cent of the original total estimated cost (\$2,210,000) of fortifying El Fraile Island as carried in the estimate submitted to Congress last year.

The estimate of the Taft Board for completing the mine defenses of insular ports was.....

Submarine mine defense.	This amount should be decreased by the following items since included in other estimates:	\$1, 767, 640
For searchlights for mine fields.....		\$174, 000
For mine planters and other boats.....		143, 800
For wharf, Guantnamo.....		20, 000
For fire control (Signal Department).....		2, 457
		<hr/> \$340, 257

And increased by the following items added since the report of the Taft Board:

For magazines for explosives (Engineer Department).....	\$55,000
For panel boards, increased cost of (Ordnance Department).....	450
	<hr/> \$55,450

Or a net decrease of..... \$284,807

Subtracting there remains..... 1,482,833
as the revised estimate for completing the submarine mine defenses of the insular ports.

Of this \$1,482,833, \$645,500 relates to *submarine mine structures* under the Engineer Department, and \$837,333 to *submarine mine material* under the Ordnance Department.

Considering the estimate	\$645,500
for providing submarine mine structures for insular ports, the amount	227,000
was estimated for submarine mine structures for Guantanamo, San Juan, Guam, and Kiska Island.	

Subtracting, there remains	418,500
as the cost of providing submarine mine structures for Manila and Subic Bays, Honolulu, and Pearl Harbor.	

There has been appropriated for submarine mine structures for insular ports since the report of the Taft Board..... \$329,000
which amount should be increased by..... 150,000
appropriated prior to the report of the Taft Board,

	<hr/> \$479,000
and reduced by	60,500
for excess in cost of structures built over estimate,	

making a net sum of.....	418,500
which is the full amount required for submarine mine structures for Manila and Subic Bays, Honolulu, and Pearl Harbor, and has been applied to those localities.	

This leaves nothing to be appropriated for submarine mine structures in future for these localities.

Considering the estimate	837,333
for submarine mine material for insular ports, the amount	242,432
was estimated for Guantanamo, San Juan, Guam, and Kiska Island.	

Subtracting, there remains.....	594,901
as the cost of the submarine mine material for Manila and Subic Bays, Honolulu, and Pearl Harbor.	

There has been appropriated for submarine mine material for insular ports since the Taft Board reported..... \$557,060
which amount should be reduced by..... 190
for excess in cost of material over estimates,

making a net reduction of.....	556,870
which has been applied to completing the submarine mine structures for Manila and Subic Bays and Honolulu.	

This leaves.....	38,031
for providing the submarine mine material for Pearl Harbor.	

The value of submarine mines as an element of seacoast defenses, and the necessity for completing the submarine-mine defenses before the outbreak of war, is set forth in this report under the corresponding item for home ports. These remarks apply with equal force to the insular ports. The amount, \$38,031, required to provide the sub-

marine-mine material for Pearl Harbor, which will permit the channel leading to that important naval base to be closed to the vessels of an enemy, should be provided at an early date.

The estimate of the Taft Board for electric plants, both central and emplacement, for the insular ports was.....	\$788, 713
Electric plants. Of this amount.....	210, 445
was estimated for electric plants for Guantanamo, San Juan, Guam, and Kiska Island.	
Subtracting, there remains.....	578, 268
as the estimate of the Taft Board for electric plants for Manila and Subic Bays, Honolulu and Pearl Harbor.	
This amount has been reduced by.....	\$238, 292
appropriated since the report of the Taft Board,	
and also by.....	66, 391
savings made to date on actual cost of construction over estimates.	305, 223
Subtracting, there remains.....	273, 045
as the estimate for completing the electric plants for Manila and Subic Bays, Honolulu and Pearl Harbor.	
An estimate for that part of this amount needed to complete the central plants for Manila Bay.....	127, 346
will be submitted to Congress this year,	
leaving.....	145, 699
to be estimated for in future to complete the emplacement plants for Manila and Subic Bays and the central plants for Honolulu and Pearl Harbor.	

The amount (\$145,699) is composed of the following items:

Locality.	Central plants.	Emplacement plants.	Total.
Manila Bay.....		\$21, 613	\$21, 613
Subic Bay.....		89, 617	89, 617
Honolulu and Pearl Harbor.....	\$34, 469		34, 469
Total.....	34, 469	111, 230	145, 699

The urgent need for electric plants in connection with coast defenses is set forth on a preceding page of this report in connection with the remarks on the need for these plants for home ports. The need for these plants is equally urgent in the case of the insular ports. Past appropriations under this item have been sufficient to provide the central plants needed for Subic Bay and Corregidor and Carabao islands in Manila Bay, and the emplacement plants needed for Honolulu and Pearl Harbor, leaving to be provided for the four localities mentioned central plants for Honolulu and Pearl Harbor, and for El Fraile and Caballo islands in Manila Bay, and emplacement plants for Manila and Subic bays. Of this work the most urgent—the completion of the central plants for El Fraile and Caballo islands—has been included in the estimates to be submitted to Congress this year.

The estimate of the Taft Board for searchlights for the gun defenses of insular ports was.....	\$589, 000
Searchlights. This amount must be increased by the amount.....	174, 000
estimated by the board for mine lights for insular ports, which was carried in the report of the board in its estimate for submarine defenses, but which has since been subtracted from that item and added to the board's estimate for gun lights.	
This amount must also be increased by.....	71, 000
due to increase in cost per light over figures used by the Taft Board, this increase being \$1,400 for a 60-inch light and \$1,800 for a 36-inch light, which for the thirty-four 60-inch and thirteen 36-inch lights recommended by the Taft Board for insular ports amounts to \$71,000.	

This amount must still further be increased by..... \$81,600
 on account of an increase of four 60-inch lights in the number of lights
 now estimated for over the number estimated for by the Taft Board.

This makes the corrected estimate for searchlights for insular ports.. 915,600
 Of this corrected estimate..... 381,600
 is the estimated cost of searchlights for Guantanamo, San Juan, Guam, and
 Kiska Island.

Subtracting, there remains..... 534,000
 as the corrected estimate for searchlights for Manila and Subic bays,
 Honolulu and Pearl Harbor.

This estimate is itemized as follows, the estimated cost of a 60-inch light
 being \$20,400 and of a 36-inch light, \$10,800:

Manila Bay—			
Fourteen 60-inch lights.....	\$285,600		
One 36-inch light.....	10,800		
			296,400
Subic Bay—			
Two 60-inch lights.....	40,800		
Three 36-inch lights.....	32,400		
			73,200
Honolulu and Pearl Harbor—			
Seven 60-inch lights.....	142,800		
Two 36-inch lights.....	21,600		
			164,400

Total..... 534,000

This amount has been reduced by 323,500
 appropriated since the report of the Taft Board, and allotted as follows:

Manila Bay—			
Eight 60-inch lights.....	\$163,200		
Unapplied balance on hand.....	6,000		
			\$169,200
Subic Bay—			
Two 60-inch lights.....	40,800		
Honolulu and Pearl Harbor—			
Five 60-inch lights.....	102,000		
One 36-inch light.....	10,800		
Unapplied balance on hand.....	700		
			113,500

Total..... 323,500

Subtracting, there remains 210,500
 as the estimate for completing Manila and Subic Bays, Honolulu and Pearl
 Harbor.

This estimate is itemized as follows:

Manila Bay—			
Six 60-inch lights.....	\$122,400		
One 36-inch light.....	10,800		
			\$133,200
Which must be reduced by.....	6,000		
unapplied balance on hand,			
leaving.....			\$127,200
as the estimate for completing Manila Bay.			
Subic Bay—			
Three 36-inch lights.....	32,400		
Honolulu and Pearl Harbor—			
Two 60-inch lights.....	\$40,800		
One 36-inch light.....	10,800		
			\$51,600
Which must be reduced by.....	700		
unapplied balance on hand,			
leaving.....			50,900
as the estimate for completing Honolulu and Pearl Harbor.			
Total.....			210,500

An estimate for that part of this amount (\$210,500) needed to provide the following lights for Manila and Subic Bays:

Manila Bay—	
Five 60-inch lights.....	\$102, 000
One 36-inch light.....	10, 800
	<hr/>
	\$112, 800
Which must be reduced by.....	6, 000
unapplied balance on hand,	
leaving	<hr/>
	\$106, 800
Subic Bay—	
Three 36-inch lights	32, 400
	<hr/>
	\$139, 200
will be submitted to Congress this year,	
leaving	<hr/>
	71, 300
for completing the searchlight projects for Manila Bay, and	
Honolulu and Pearl Harbor, to be estimated for in future.	
This amount is estimated as follows:	
Manila Bay—	
One 60-inch light.....	\$20, 400
Honolulu and Pearl Harbor—	
Two 60-inch lights.....	\$40, 800
One 36-inch light.....	10, 800
	<hr/>
	\$51, 600
Which must be reduced by.....	700
unapplied balance on hand,	
leaving.....	<hr/>
	50, 900
as the estimate for completing Honolulu and Pearl	
Harbor.	
Total.....	<hr/>
	71, 300

The need for the additional searchlights for Manila and Subic Bays for which an estimate will be submitted to Congress this year is urgent, as they are required for gun and mine defenses already authorized. At night gun defenses are useless, and mine fields may be removed without great danger to the attacking force, if the defenses are not provided with searchlights. The estimate for searchlights for insular ports, to be submitted to Congress this year is the minimum consistent with the proper utilization of the gun and mine defenses already authorized; and Congress should be urged to appropriate the full amount of the estimate at its next session.

The estimate of the Taft Board for fire control for insular ports was.....	\$1, 895, 557
Of this amount.....	770, 424
Fire control. was estimated for fire control for Guantanamo, San	
Juan, Guam, and Kiska Island.	
Subtracting, there remains.....	<hr/>
as the Taft Board estimate for fire control for Manila and Subic	1, 125, 133
Bays, Honolulu, and Pearl Harbor.	
This amount has been reduced by.....	\$625, 000
appropriated since the report of the Taft Board,	
and also by.....	250, 133
savings in actual cost of fire-control systems installed over	
Taft Board estimates.	<hr/>
	875, 133
Subtracting, there remains.....	<hr/>
as the cost of completing the fire-control installations for Manila	250, 000
Bay and Pearl Harbor, the installations for Subic Bay and Hono-	
lulu having been completed from past appropriations.	
An estimate for that part of this amount needed to complete the fire-control	
installations for Pearl Harbor and El Fraile Island.....	200, 000
will be submitted to Congress this year,	
leaving.....	<hr/>
to complete the fire-control installation for Caballo Island in	50, 000
Manila Bay, thus completing the fire-control installation for	
Manila Bay, to be estimated for in future.	

Past appropriations for fire control for insular ports have been sufficient to complete the fire control installations for Subic Bay and Honolulu, and for Corregidor and Carabao islands in Manila Bay. The amount estimated this year is urgently needed for installing fire-control systems for armament already authorized at Pearl Harbor and at El Fraile Island in Manila Bay.

The estimate of the Taft Board for completing the supply of reserve ammunition for insular ports was.....		\$2, 900, 000
Ammunition.	This amount should be increased by.....	737, 712
	on account of error made by Taft Board in estimating cost of ammunition.	
This makes the corrected estimate.....		3, 637, 712
for completing the supply of reserve ammunition for insular ports.		
Of this amount.....		1, 388, 754
is estimated for Guantanamo, San Juan, Guam, and Kiska Island.		
Subtracting there remains.....		2, 248, 958
as the corrected estimate for completing the reserve supply of ammunition for Manila and Subic Bays, Honolulu and Pearl Harbor, at the date the Taft Board reported.		
This amount has been reduced by.....		900, 000
appropriated since the report of the Taft Board.		
Subtracting there remains.....		1, 348, 958
as the cost of completing the reserve supply of ammunition for Manila and Subic Bays, Honolulu and Pearl Harbor at present.		
An estimate for.....		500, 000
for reserve ammunition for Manila and Subic Bays, Honolulu and Pearl Harbor, will be submitted to Congress this year,		
leaving.....		848, 958
to be estimated for in future for these four localities.		

Past appropriations have been sufficient to provide only a partial supply of ammunition for the armament of the insular ports already completed, while \$1,219,839 is required to complete the supply of ammunition for the armament of the insular ports completed and under construction. On account of the distance of the insular ports from the United States ammunition can not be supplied to them after the outbreak of war, not even during the period intervening between the time when a war appears imminent and the date of its outbreak. The necessity, therefore, for completely equipping the defenses of each insular port in time of peace with a full supply of ammunition is apparent. The full amount of the estimate to be submitted to Congress this year, \$500,000, which is only 40 per cent of the amount required to complete the supply of ammunition for the armament already authorized, is urgently needed and should be appropriated at the next session of Congress.

In connection with the above itemized statements showing the existing condition of the different elements of the defense of insular ports, I desire to emphasize the fact that in my opinion the policy to be followed by the War Department in the preparation of estimates for the fortification of insular ports and in their presentation to Congress should involve the provision of the accessories necessary for the armament more or less contemporaneously with the provision of the armament itself. The futility of the opposite policy, that of providing an armament without providing its accessories at the same time, which policy was followed for many years in fortifying home ports, is apparent from the fact that a large percentage of the armament now installed in the home ports, involving an expenditure of many millions of dollars, is to a large degree ineffective, due to the lack of the necessary accessories for the armament provided; and

Application of future appropriations for defenses of insular ports.

that at the present rate of congressional appropriation a considerable number of years will elapse before this condition will be wholly remedied. In fortifying the insular ports this error made in fortifying home ports should be avoided, and the installation of necessary accessories should proceed contemporaneously with the installation of the armament.

The importance of the early completion of the coast defenses of the insular ports of Manila and Subic Bays and of Honolulu and Pearl Harbor lies in the fact that such defenses are necessary not only for the protection and retention of these ports, but also, and of greater moment as affecting fundamentally any scheme of national defense, for affording secure naval bases and coaling stations. Without such fortified bases the retention of our insular possessions, the protection of our commerce, and the ability of our navy to conduct offensive operations outside of narrow zones bordering upon the coasts of the United States can be assured only by stationing in every possible theater of operations a fleet superior to the combined fleets of the enemy; a condition wholly impracticable of attainment. The alternative of providing well-fortified bases in our insular possessions, freeing the navy for the most effective mobilization and the widest range of action, can be carried out at a very small fraction of the cost of such a naval policy.

The insular ports that require defenses for strategic reasons were decided upon by the Taft Board and the work of fortifying several of them is now well advanced toward completion. On account of the fact that the strategic value of Manila and Subic Bays, Honolulu, and Pearl Harbor exceeds that of other localities in the insular possessions, all appropriations have been applied to these localities except a small amount allotted to Guantanamo prior to the report of the Taft Board.

The urgency of the early completion of the defenses of Manila and Subic Bays, Honolulu, and Pearl Harbor, therefore, can scarcely be overestimated. Whether viewed from a military standpoint or from the standpoint of the broadest national policy, the necessity for secure defenses for these localities, the sine qua non for the successful conduct of a war which involves the Pacific Ocean as a theater of operations, must be apparent to the most casual observer. The completion of the fortification projects for these localities will involve an expenditure of only \$4,985,334, and I renew the recommendation made in my report of last year that the War Department, in presenting to Congress the needs of the military service, lay special stress upon the importance and urgency of the early completion of the defenses of the insular ports now being fortified.

(c) MATERIAL OF THE ISTHMIAN CANAL PORTS.

In its report of February 1, 1906, the Taft Board reported, as necessary for the provision of the seacoast defenses for the Isthmian Canal ports, as follows:

Guns, carriages, and emplacements.....	\$3, 008, 920
Electric plants.....	255, 596
Searchlights.....	228, 000
Fire control.....	435, 166
Ammunition.....	900, 000
Total cost.....	4, 827, 682

The necessity for defending the Isthmian Canal ports is well set forth in the following extract from the report of the Taft Board, dated February 1, 1906:

The United States has secured a valuable possession, the Canal Zone, and is to expend large sums of money for the construction of the Panama Canal, a waterway of vital strategic and commercial importance to the United States. While it may appear that the ultimate defense of the canal must rest with the navy, the fleet should not be tied so closely to it as to lose its offensive power; moreover, it is readily conceivable that control of the sea in the vicinity might be temporarily lost either on the Atlantic or Pacific coast, making land defenses necessary and advisable, since the cost of fortifications would be but a small percentage of the damage which would be quickly inflicted upon the plant and operation of the canal.

After the canal is completed, the capture of or damage to either entrance might prevent the passage of war vessels between the Atlantic and Pacific oceans, though the concentration of the two fleets might be of vital importance to the national welfare.

No appropriations have been made as yet for any part of these defenses. The Taft Board in its report of February 1, 1906, expressed the further opinion that specific appropriations for the defenses for the Isthmian Canal ports should be included in appropriations for the construction of the canal. In my opinion the time has now arrived at which the work of fortifying these ports should be begun, and it is earnestly recommended that Congress be asked to authorize at its next session the initiation of this work.

BARRACKS AND QUARTERS FOR THE COAST ARTILLERY.

On November 21, 1906, the Secretary of War approved the plans submitted by the Chief of Coast Artillery for the distribution of coast artillery troops, whereby 36 posts were selected to be garrisoned, each by at least one company, the remaining posts to be administered as "subposts" provided with care-taking detachments only. The terms "concentration scheme" and "concentration posts" have come to be commonly used in referring to these plans and to the 36 garrisoned posts. The use of these terms is likely to lead to a misconception unless it is understood that at no post is concentration contemplated beyond the requirements of one manning detail for the armament of that post, and taking into consideration the entire 36 posts the present Coast Artillery Corps of 170 companies would provide but sixty per cent of one manning detail for the existing armament of those posts.

The important advantages of the concentration scheme, when compared with the former scheme for stationing at each coast artillery post a proportion of the authorized strength of the coast artillery personnel based on the armament of each post, are economy in administration and efficiency in training; the annual saving in cost of administration under the concentration scheme as against the former scheme being about \$710,000, and about 60 per cent of one manning detail at each post being possible as against about 30 per cent under the former scheme. Upon the approval of the concentration scheme by the Secretary of War the features of the scheme and the advantages thereof were represented to Congress, and at the same time estimates amounting to \$1,469,300 were submitted for inaugurating the work necessary to carry the concentration scheme into effect. For the strength of the coast artillery at that time it was calculated that a total expense of \$2,769,300 was involved.

While the consideration of this question of barracks and quarters required for the concentration scheme was in progress in Congress,

the Coast Artillery Corps was increased by 44 companies by the act of January 26, 1907. On the passage of this act it became necessary to provide at once additional barracks and quarters for the increase in coast artillery personnel. Estimates prepared at the time by the Quartermaster-General, and submitted to Congress, showed that an expenditure of \$6,300,000 was necessary to provide barracks and quarters for the entire increase in the artillery personnel authorized by the act, which included not only 44 companies of coast artillery, but also one regiment of field artillery. The army appropriation bill carrying this amount passed both Houses of Congress; but due to a misunderstanding between the committees handling the various bills the total amount was eventually stricken out. Of the \$6,300,000 required for barracks and quarters for the entire artillery increase, it was estimated that \$4,600,000 pertained to the coast artillery and the remainder to the field artillery. In addition to barracks and quarters, there were needed for coast artillery administration purposes, on account of the increase, guardhouses, administration buildings, storehouses, shops, and additions to buildings, estimated to cost \$1,000,000. The only funds immediately available for this work were those carried under the regular appropriation for barracks and quarters, seacoast defense, amounting that year to \$1,250,000.

Had it not been for the misunderstanding above referred to, whereby no special appropriation was made for housing the increased personnel, it would have been possible to undertake the concentration of the troops serving at the subposts at the date of the passage of the increase bill at the same time that provision was made for the increased personnel at the concentration posts. Under the circumstances, however, the housing of the latter was of the first necessity, and in order to conform to the approved plans, it was decided that all new buildings for the accommodation of the increase in the personnel should be constructed at concentration posts. The most urgent need was for barracks, followed in order by that for quarters for officers and noncommissioned officers, and for guardhouses, storehouses, administration buildings, etc.

A special case, and one of importance, was the need for new buildings at Fort Monroe, estimated to cost \$528,000, for the Coast Artillery School, which was about to be organized on a new basis to include the School of Submarine Defense theretofore at Fort Totten, N. Y.

The following were the estimates of the cost of barracks and quarters and other buildings needed by the coast artillery at the date of increase, January 25, 1907, in order that its entire personnel should be effectively housed, economically administered, and efficiently trained:

Concentration of personnel existing prior to passage of increase bill.....	\$2, 769, 300
Barracks and quarters due to increase.....	4, 600, 000
Other buildings due to increase.....	1, 000, 000
Special buildings at Fort Monroe.....	528, 000

Total..... 8, 897, 300

At that time there were also projects which had received the approval of the War Department, and concerning which the committees of Congress had been informed, for the rebuilding of Fort Hamilton and the building of new posts at Galveston, Tex. (Fort Crockett), Key West, Fla. (Fort Taylor), and San Francisco, Cal. (Fort Winfield Scott). The estimates for these were as follows:

Fort Hamilton.....	\$250,000
Fort Crockett.....	250,000
Fort Taylor.....	650,000
Fort Winfield Scott.....	1,000,000
Total.....	2,150,000

These projects, distinct at the time they were first considered, have since become merged into the work of providing for the increase of the coast artillery and have been partially executed.

Since the passage of the act increasing the coast artillery, the following appropriations have been made for barracks and quarters, seacoast defense:

Act of March 4, 1907.....	\$1,250,000
Act of May 27, 1908.....	2,139,060
Act of March 4, 1909.....	1,500,000
Total.....	4,889,060

which is the amount by which above estimates of 1907, viz, \$8,897,300, have been reduced. This leaves a balance of \$4,008,240.

The following table shows the barracks and quarters now provided at concentration forts, those required to complete the scheme for 170 companies and the estimated cost of completion, the latter amount being \$3,999,000, which differs from the balance just deduced by only \$9,240. The "other buildings due to increase," for which \$1,000,000 is above estimated, have been or are being provided at all posts but Fort Taylor and Fort Winfield Scott.

District.	Now provided at concentration forts.						Required to complete scheme of concentration for 170 companies of coast artillery.						Cost of completion.
	Company barracks.	Band barracks.	Field officers' quarters.	Captains' and lieutenants' quarters.	Bachelor quarters.	Noncommissioned staff officers' quarters.	Company barracks.	Band barracks.	Field officers' quarters.	Captains' and lieutenants' quarters.	Bachelor quarters.	Noncommissioned staff officers' quarters.	
Portland.....	12	1	6	24	10	36	.....	.....	1	3	.....	1	\$43,000
Portsmouth.....	.....	.....	.....	.....	.....	.....	3	1	1	10	.....	9	279,000
Boston.....	11	1	4	28	5	33	1	2	4	.....	.....	.....	107,000
New Bedford.....	1	.....	1	3	.....	5	1	.....	5	.....	.....	.....	92,000
Narragansett Bay.....	8	1	4	22	9	14	1	1	6	4	.....	8	165,000
New London.....	12	1	6	23	9	32	1	1	2	.....	.....	.....	77,000
Eastern New York.....	7	1	4	20	8	14	.....	.....	.....	.....	6	.....	24,000
Southern New York.....	11	.....	1	24	12	28	6	1	5	16	14	.....	562,000
Delaware.....	5	1	1	12	5	13	.....	.....	1	2	.....	.....	30,000
Baltimore.....	4	.....	2	9	4	11	.....	.....	2	.....	.....	1	22,000
Potomac.....	5	.....	2	8	8	12	.....	1	1	.....	3	.....	33,000
Chesapeake Bay.....	10	1	6	60	52	38	.....	.....	7	.....	.....	.....	63,000
Cape Fear.....	3	.....	1	11	.....	7	.....	.....	.....	.....	1	.....	4,000
Charleston.....	4	1	1	10	4	11	1	.....	4	.....	.....	1	95,000
Savannah.....	4	1	.....	11	5	8	.....	.....	1	2	.....	1	34,000
Key West.....	.....	.....	.....	.....	.....	.....	6	1	4	14	5	10	641,000
Tampa.....	2	.....	1	6	.....	12	.....	.....	3	.....	.....	.....	31,000
Pensacola.....	5	.....	2	14	8	16	.....	.....	.....	.....	1	.....	4,000
Mobile.....	4	1	2	11	.....	11	.....	.....	.....	.....	.....	.....	.....
New Orleans.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Galveston.....	2	.....	.....	8	.....	8	1	.....	1	3	.....	1	90,000
San Diego.....	2	.....	1	8	.....	9	.....	.....	.....	.....	.....	.....	.....
San Francisco.....	7	.....	.....	14	4	17	11	1	9	26	8	16	983,000
Columbia.....	3	.....	1	8	.....	14	2	.....	3	2	4	.....	168,000
Puget Sound.....	10	1	3	28	5	32	4	.....	4	5	4	1	305,000
Totals.....	132	11	49	362	139	381	38	3	36	117	25	74	3,752,000
Other buildings:													
Fort Taylor.....													117,500
Fort Winfield Scott.....													129,500
Grand total.....													3,999,000

• Also 3 old sets.

As soon as practicable after the increase in the coast artillery, the additional 44 companies were organized and they have since been recruited up to their maximum authorized strength. They have been doubled up in existing barracks or quartered in tents until such time as the construction of barracks could be completed; all of the barracks are not yet finished and occupied, but the worst of the overcrowding is now being rapidly relieved. This condition has also been improved in another way. The completion of part of the defenses of the Philippine Islands and Hawaii during this period made it advisable to send at once coast artillery troops to mount and man the guns for these forts. Eight companies have so far been sent away from home posts for this purpose and 14 more will soon be required for the armament nearing completion. Barracks and quarters for these companies are now being provided in the insular possessions.

There will then remain in the United States 148 companies, and the proposed distribution of these, by artillery districts, is as given in the table below. The table also gives the approved distribution of 170 companies for the home posts, and the barracks and quarters which are provided for at concentration posts in the several artillery districts:

Artillery district.	Companies under approved distribution.	Companies proposed on 148 basis.	Provided for at concentration posts.			Companies not provided for at concentration posts on 148 basis.
			Barracks.	Officers' quarters.	Noncommissioned staff officers' quarters.	
Portland.....	12	12	12	40	36	.....
Portsmouth.....	3	.....	.....	.....	.....	.....
Boston.....	12	11	11	37	33	.....
New Bedford.....	2	1	1	4	5	.....
Narragansett Bay.....	9	8	8	26	14	.....
New London.....	13	12	12	38	32	.....
Eastern New York.....	7	7	7	32	14	.....
Southern New York.....	17	13	11	37	28	2
Delaware.....	5	5	5	18	13	.....
Baltimore.....	4	4	4	15	11	.....
Potomac.....	5	5	5	18	12	.....
Chesapeake Bay.....	10	10	10	118	38	.....
Cape Fear.....	3	3	3	12	7	.....
Charleston.....	5	4	4	15	11	.....
Savannah.....	4	4	4	16	8	.....
Key West.....	6	3	.....	.....	.....	3
Tampa.....	2	2	2	7	12	.....
Pensacola.....	5	5	5	24	16	.....
Mobile.....	4	4	4	13	11	.....
Galveston.....	3	2	2	8	8	.....
San Diego.....	2	2	2	9	9	.....
San Francisco.....	18	18	7	18	17	11
Columbia.....	5	3	3	9	14	.....
Puget Sound.....	14	10	10	36	32	.....
Total.....	170	148	132	550	381	16

The last column of the above table shows what companies are not provided with barracks at concentration posts. The 2 in the Southern Artillery District of New York will occupy old casemates at Fort Wadsworth. The 3 in the artillery district of Key West will be at Key West Barracks instead of Fort Taylor. The 11 in the artillery district of San Francisco will be at Fort Barry, 2; at Fort Miley, 2; and at the Presidio of San Francisco, 7.

It is in the latter two districts that the conditions prevail demanding the most serious attention. At Key West Barracks the buildings are old, inadequate, and separated from the guns by the city of Key West. These objections alone led me to recommend long ago that instead of remodeling and adding to the present buildings the site of the post be transferred to Fort Taylor. Since that time the state of affairs has been materially changed for the worse by the construction of the tracks and terminal yards of the Florida East Coast Railway directly in front of the old post, cutting it off from the bay and rendering the sewage disposal system, in spite of all efforts so far, a grave menace to the health of the troops and the community. The War Department most properly took the position that it could not stand in the way of a great public improvement by opposing the desire of the railway company to utilize this route of approach, which was important to their interests; but the carrying out of the railroad's plans renders imperative what was before eminently desirable, the transfer of the garrison to the opposite side of the island of Key West. Under the appropriation made two years ago enough land has been secured adjoining the Fort Taylor Reservation to cover the sites of the most important buildings of the new post as laid out by the board which considered the matter; but additional land is necessary for the complete development of the post, and it is urged that estimates for the same be submitted to Congress, as well as for the amount necessary to construct barracks and quarters for at least three companies.

The situation in San Francisco is well known to the War Department and need not be dealt with here at length. The artillery troops at the Presidio are occupying quarters which not only are not suitably located with reference to the armament, but also are urgently needed for troops of the mobile army that, for strategic reasons, should most certainly be stationed in that vicinity. The other posts in the harbor are so overcrowded and uncomfortable that nothing but the military necessity of retaining the organizations at that port prevents this office from recommending that they be sent to some other point where their health and well-being could be better cared for.

The table below shows the localities where the \$1,500,000 appropriated by the act approved March 4, 1909, is being expended:

Building project, fiscal year 1909-10.

[Appropriation Mar. 4, 1909.]

Posts.	Amounts for bar- racks and quarters.	Amounts for other buildings.	Total.
Adams, Fort, R. I. ....	.....	\$1,500	\$1,500
Andrews, Fort, Mass.	\$137,000	40,449	177,449
Baker, Fort, Cal. ....	.....	19,393	19,393
Barrancas, Fort, Fla.	8,000	23,150	31,150
Caswell, Fort, N. C.	36,000	4,000	40,000
Constitution, Fort, N. H. ....	.....	4,000	4,000
Crockett, Fort, Tex. ....	.....	55,500	55,500
Dade, Fort, Fla. ....	.....	18,857	18,857
DuPont, Fort, Del.	52,000	5,100	57,100
Greble, Fort, R. I. ....	.....	18,850	18,850
Hamilton, Fort, N. Y.	66,000	4,000	70,000
Hancock, Fort, N. J.	8,000	15,000	23,000
H. G. Wright, Fort, N. Y.	38,000	61,474	97,474
Howard, Fort, Md.	20,000	26,800	46,800
McKinley, Fort, Me.	16,000	24,000	40,000
Monroe, Fort, Va.	122,000	60,750	182,750
Morgan, Fort, Ala.	34,000	4,700	38,700
Moultrie, Fort, S. C. ....	.....	23,700	23,700

Building project, fiscal year 1909-10—Continued.

Posts.	Amounts for bar- racks and quarters.	Amounts for other buildings.	Total.
Miley, Fort, Cal.		\$821	\$821
Pickens, Fort, Fla.		1,200	1,200
Preble, Fort, Me.		4,000	4,000
Revere, Fort, Mass.		700	700
Rodman, Fort, Mass.		4,000	4,000
Rosecrans, Fort, Cal.		14,700	14,700
St. Philip, Fort, La.		500	500
Screven, Fort, Ga.		23,000	23,000
Smallwood, Fort, Md.		7,500	7,500
Stevens, Fort, Oreg.		21,000	21,000
Strong, Fort, Mass.	\$8,000	50,414	58,414
Terry, Fort, N. Y.		26,437	26,437
Totten, Fort, N. Y.		4,800	4,800
Wadsworth, Fort, N. Y.		700	700
Ward, Fort, Wash.		111,000	111,000
Washington, Fort, Md.	32,000	13,200	45,200
Williams, Fort, Me.	76,000	59,600	135,600
Winfield Scott, Fort, Cal.	65,000		65,000
Worden, Fort, Wash.	25,000	400	25,400
Reserve for emergencies.			3,805
Grand total.	741,000	755,195	1,500,000

The allotments indicated in the above table are practically in accord with the estimates, omitting the large items for Forts Taylor and Winfield Scott. The entire appropriation would have been insufficient to do the necessary work at these two places; and if it had been allotted to carry out that work as far as possible, the result would have been that a large portion of the other coast artillery posts in home ports would have had to struggle with inadequate means for the maintenance of proper administration, discipline, and protection of government property.

As stated in my last annual report, the first need on account of the increase, that for barracks, having been met, the next was for officers' and noncommissioned staff officers' quarters; and the current building project provides for 2 company barracks, 1 band barrack, 5 field officers' quarters, 57 company officers' quarters, and 36 noncommissioned staff officers' quarters.

Insular ports. The estimate for barracks and quarters for coast artillery troops, insular ports		\$1,630,000
Submitted to Congress at its last session, covered—		
A 10-company post, Corregidor Island, Philippine Islands.	\$780,000	
A 4-company post, Grande Island, Philippine Islands.	425,000	
A 4-company post, Waikiki, Hawaii	425,000	
Total.....	1,630,000	
This amount should be reduced by		600,000
appropriated at the last session of Congress; of which \$550,000 was allotted for construction on Corregidor Island and \$50,000 for construction at Waikiki.		
Subtracting, there remains.....		1,030,000
to complete the estimate submitted last year.		
To this amount should be added.....		200,000
to provide barracks and quarters for the 4 companies needed to man the additional armament in Manila Bay now under construction and to be completed or practically completed by the close of the present fiscal year, provision for which was not included in last year's estimate.		
This makes		1,230,000
as the estimate to complete barracks and quarters for the coast artillery troops needed to man the armament in the insular ports completed or to be completed during the present fiscal year.		

The need for barracks and quarters for coast artillery troops at Manila and Subic bays and at Honolulu is urgent; in fact, far more urgent than the need for additional barracks and quarters for coast artillery troops in the United States. Such rapid progress has been made in the installation of the defenses for the insular ports that the armament completed or to be completed before the close of the present fiscal year in Manila Bay will require 14 companies for one manning detail, and that in Honolulu 4 companies, while that already completed in Subic Bay requires 4 companies, a total of 22 companies for the three localities. The total armament now authorized for the insular ports will require 29 companies for one manning detail.

On account of the distance of the insular ports from the United States, which renders it improbable that sufficient time will be available when a war appears imminent and before its outbreak to enable coast artillery troops sent from the United States to reach those ports, a full manning detail for the defenses must be maintained in those ports at all times, otherwise in case of sudden war the expenditures made on these defenses will have been wasted. For this reason the construction of barracks and quarters at insular ports should proceed concurrently with the construction of fortifications. At the present time, due to lack of available accommodations, it has been found possible to station only 4 companies of coast artillery in Manila Bay, 2 in Subic Bay, and 2 at Honolulu. The companies stationed in Manila and Subic bays are quartered in temporary frame quarters; those at Honolulu in tents. The amount of the estimate, \$605,000, to be submitted to Congress this year will, with the appropriation of \$600,000 of last year, be sufficient to provide barracks and quarters for only 10 companies in Manila Bay and 4 companies at Honolulu. This estimate is regarded as the minimum consistent with the progress of the defenses at these ports, and it is earnestly recommended that the full amount be appropriated at the next session of Congress.

TARGET PRACTICE FOR COAST ARTILLERY.

The final objective of the coast artillery personnel assigned to gun defense is to hit with their guns. The efficiency of the gun defense from year to year is chiefly evidenced, therefore, in target practice. This efficiency has gradually increased in the past decade, and the reports of target practice for 1908 show decided improvement over the previous year.

The improvement in practice is especially marked in the case of the mortars. In 1907 the mean percentage of hits with
Practice with mortars for 1908. mortars was 14.7; in 1908 it was 29.4. The mortar company which did the best shooting in 1907 made 44 per cent of hits, or 7 hits out of 16 shots in twenty minutes and twenty-five seconds, scoring 0.343 hits per minute, while in 1908 many mortar companies made 60, 70, and 80 per cent of hits. One mortar company in 1908 fired 10 shots in six minutes and forty-nine seconds and made 6 hits, and another mortar company in 1908 made 8 hits out of 10 shots in a total corrected time of nine minutes and twenty-eight seconds. One of these mortar companies averaged 0.845 hits per minute and the other 0.881 hits per minute. These records were

made by firing one mortar at a time. In war it is contemplated to fire mortars in groups of 4, or possibly 8, so that hits per minute which are now being made in practice with mortars fired singly should then be greatly multiplied. As each mortar projectile weighs 800 or 1,000 pounds and carries from about 30 to 60 pounds of high explosive, and as each hit of a mortar is on the deck, the most vulnerable part of a battle ship, the value of our mortars as war weapons, with the hitting capacity above shown, can hardly be overstated. Their moral effect alone, it is believed, would be sufficient to deter even the most enterprising fleet commander from coming under their fire except in case of the greatest possible necessity.

The mean percentage of hits with heavy guns for 1908 is slightly under that for 1907. To explain the seeming discrepancy of this statement with that given above that target practice reports for 1908 show decided improvement in practice over that in 1907, it should be stated that the actual number of hits with guns in 1908 were less than in 1907, due to the fact that the size of the target upon which hits are now counted was greatly reduced for 1908. In 1907 the target was 435 feet wide; in 1908 it was 60 feet wide. Lateral misses with guns were unknown in 1907, while in 1908 a great many lateral misses were made on the 60-foot target, especially at long ranges. The target for 1908 was 6 feet higher than it was for 1907; but there were more hits lost in 1908 on account of the 375-foot reduction in width of the target than those were gained on account of the 6-foot increase in height. The narrow 60-foot target, however, greatly improved the work of the gun pointers and has been of material benefit in the development of good shooting.

The average with the big guns for 1908 was further lowered by the poor results obtained with guns which were found to be no longer accurate with projectiles having the present form of rotating band. For instance, at one battery of 12-inch disappearing guns, where a great many visiting companies have been firing in past years, five practices were held last year in which no hits were made, and there were only four other practices with all other 12-inch disappearing guns held last year in which no hits were made. It can be seen, therefore, that the firing at this one 12-inch battery, together with the poor results with similar batteries of other caliber at other places, greatly reduced the mean percentage with guns last year.

It was not known at the beginning of 1908 that these guns were no longer accurate, as stated above; but it is now believed that this fact has been clearly demonstrated. With a view to restoring the accuracy of guns that appear to be worn out, a new form of rotating band has been designed by the Ordnance Department, and from results already obtained in two tests with the new band the indications are that it will restore the accuracy of guns that are no longer accurate with the present service bands. It is expected that for practice next year all guns which are no longer reliable with the old projectiles will be provided with projectiles with the new form of rotating band.

The practice with the rapid-fire guns improved slightly last year. The fact that greater improvement was not shown is, as stated in my last report, partly explained by the fact that the carriages of these guns are not equipped with quadrant elevation scales. A further explanation is that the

Practice with
heavy guns for 1908.

Practice with
rapid-fire guns for
1908.

older model carriages for the 3-inch guns are unsuitable for rapid manipulation and accurate laying. Designs for the modification of these carriages, and for the equipment of all 3-inch rapid-fire carriages with quadrant elevation scales, are being prepared by the Ordnance Department; and the modifications and equipment will be made as rapidly as possible.

The annual allowance of ammunition for rapid-fire guns for 1909 has been increased from 26 to 76 rounds, permitting of four practices during the year instead of two as heretofore. The improvement in the shooting with the rapid-fire guns already evident for 1909 is undoubtedly largely attributable to this increase in the ammunition allowance for these guns.

Trial shots have been allowed with rapid-fire guns for the 1909 practices. This was done with a view to leading up to a system of fire control for these guns which contemplates the use of quadrant elevations. With this fire-control system, ranges will be supplied the guns continuously by a self-contained horizontal base range finder. These ranges will be applied to the quadrant elevation scales of the guns by a range setter, and the operation of giving elevation and direction to the gun will be performed by separate individuals.

Trial shots for rapid-fire guns.
Night firing.
 The results of night firing with Simple tracer ammunition for 3-inch guns at Fort Caswell in February, 1909, indicated the value of such firing for the instruction of all coast artillery troops assigned to rapid-fire guns, and steps have already been taken to provide for night firing at posts where it can be held with safety.

Forty-five 30 by 60 feet material targets are now being manufactured, and it is expected that these targets will be supplied to all artillery districts of home ports in time for the 1910 target practice. This material target consists of fish netting suspended on a wooden float by iron masts. The latest form of these masts is that of the basket masts recently adopted by the navy, one of which is at each end of the raft. The fish netting reduces the destructive effect of wind and waves to a minimum, and shows a clean round hole when a projectile passes through it. Only shots which pass through the screen or strike the raft within the limits of the length of the target are to be counted hits. This will be an improvement over the old method of counting "constructive" hits, and will enable an exact comparison of different practices to be made. This material target has already been used in some districts, and it is very evident that its general use will stimulate competition and thereby greatly increase interest in target practice.

Material targets.
Publication of target practice results.
 A consideration of the results of target practices for 1908, convinced me that gun companies must learn to shoot at short ranges, where they can reasonably be expected to hit, before being advanced to long ranges. Experience proves that efficient gunnery is a problem which requires for its proper solution intelligent consideration of details in connection with preparation for target practice, as well as during the practice itself. To make the study of gunnery progressive it is now prescribed that all officers shall first thoroughly familiarize themselves with gunnery

instructions; and that the first practice of a company shall be at short range. Companies now acquiring a given figure of merit at short range are advanced to longer ranges; while those not making the prescribed figure are continued at short range until they *learn to shoot*. This has already had a wholesome effect, and there is a very evident effort on the part of all gun companies to advance to the longer ranges. This method will be continued until we advance to extreme ranges with practice under war conditions, as nearly as it is possible to simulate them. It is gratifying to note that a majority of the companies firing heavy guns this year have already advanced to ranges beyond 7,000 yards, 4 miles.

In order to enable a still more systematic and thorough study of the gunnery problem to be made by our officers, a coast artillery memorandum on the subject of the preparation for and conduct of target practice was recently issued to the coast artillery service. This is a manual of practical gunnery, and besides contains useful information from the practices throughout the service in 1908. It is also contemplated to give each officer the benefit of the experience of other officers, and for this purpose such data as is valuable will be collected each year from all target-practice reports and published to the coast artillery service. From the results obtained at target practice during the past year it is evident that the interest and enthusiasm of officers and men alike in target practice are constantly growing, and that this interest and enthusiasm are doing much to advance the capacity of coast artillery gun companies to *hit with their guns*.

BOAT SERVICE FOR COAST ARTILLERY.

The service performed by the vessels assigned to the coast artillery can be divided into three distinct classes: (a) Submarine mine service, (b) artillery service, (c) passenger and freight service.

For class (a) the principal part of the work is performed by the mine planter, which is a seagoing vessel equipped with the necessary gear for planting and raising mines. This type of vessel is a product of recent years. As late as 1903 there were no facilities for giving instruction in mine planting at any post except Fort Totten, N. Y. Improvised mine planters were used there, and a limited number of officers and men were instructed in mine work each year and sent out from Fort Totten to various coast artillery posts to disseminate knowledge of submarine mining.

In 1904 four mine planters, constructed by the Quartermaster's Department in accordance with the designs of the torpedo board, were turned over to the artillery. One of these vessels was stationed at Fort Totten, N. Y., for instruction work at the School of Submarine Defense and the three others were sent to the various harbors on the Atlantic and Gulf coasts for periods of practical instruction in mine planting. The rapid increase in the efficiency of the mine defense due to the use of the planters led the Chief of Coast Artillery to present to the War Department the needs of the Pacific coast and the insular possessions in this respect, with the result that two planters were obtained for the Pacific

Mine planters.

coast and two for the insular possessions. The present distribution of the mine planters is shown in the following table:

Names.	Class.	Service performed.
Gen. Samuel M. Mills	Mine planter..	Submarine-mine instruction at Coast Artillery School, Fort Monroe, Va.
Gen. John M. Schofield.....	do.....	Submarine-mine instruction at coast artillery posts on Atlantic and Gulf coasts.
Gen. Edward O. C. Ord.....	do.....	
Gen. Royal T. Frank.....	do.....	
Col. George Armistead.....	do.....	Submarine-mine instruction at coast artillery posts in San Francisco and San Diego harbors.
Maj. Samuel Ringgold.....	do.....	Submarine-mine instruction at coast artillery posts in Puget Sound and Columbia River.
Gen. Henry J. Hunt.....	do.....	Submarine-mine instruction in Manila Bay.
Gen. Henry Knox.....	do.....	Submarine-mine instruction in Subic Bay.

The two planters assigned to Manila and Subic bays went to the Philippine Islands by way of Suez, leaving Fort Monroe, Va., December 2, 1908, and the two assigned to the Pacific coast went by way of the Straits of Magellan, starting at the same time as the other two vessels. The fact that these four vessels completed their long voyages in good condition and without untoward incident is a strong testimonial to the efficiency of the vessels, their crews, and the officers who commanded them.

The four planters on the Atlantic and Gulf coasts, the two on the Pacific, and the two in the insular possessions are sufficient for instruction purposes in time of peace. In the event of war they will be assigned to particular harbors for planting the mines required by the approved projects for those places; at the same time, as explained in my report for 1908, there will be available for service in mine planting 31 vessels of the Light-House Establishment and 9 vessels now used for passenger and freight service by the Quartermaster's Department. In this manner all of the large boats necessary for the proper planting of mines in all the fortified harbors of the United States in time of war will be available. The method of providing auxiliary planters for use in the Philippine Islands and the Hawaiian Islands in time of war is now under consideration by the War Department.

The distribution box launch which has recently been developed has proved a most valuable accessory to the mine planter. **Distribution box launches.** Thirty-two of these launches, referred to in my last report, have been completed and assigned—24 to artillery districts in the United States, 2 to the Hawaiian Islands, and 6 to the Philippine Islands. All of the reports upon the use of these launches show them to be especially suitable for the work for which they were intended. While their number is sufficient for instruction purposes in time of peace, it will be necessary, in the event of war, to supplement them in the more important harbors by hiring such boats as can be found and rendered suitable for this work.

The artillery service referred to in class (b) above, consists principally of the following: 1, Towing targets for service and subcaliber artillery practice; 2, vessel tracking drill, night drill with the use of searchlights; 3, transfer of artillery material and personnel between posts in artillery districts for repair work, inspections, and drills; 4, inspections and

Character of service to which artillery boats are applied.

visits of district and post commanders and staff officers to posts and subposts; 5, visits of ceremony by artillery district commanders to our own and foreign war vessels.

The principal types of vessels used for the above service are steamers about 100 feet in length and designed especially for towing targets for heavy gun practice, and steam and gasoline launches about 60 feet in length. Ten of the former type have been constructed from an appropriation in the act for the support of the army for 1907-8. They are fitted with the necessary gear for planting mines and are used at certain times as auxiliary mine planters. These vessels have proven highly satisfactory for all the duties which are assigned to them.

A table is given below showing all of the boats under the control of the artillery district commanders. It will be seen that some of these vessels are assigned strictly to the classes of duty given above in (a), (b), and (c), and some of them to duties in more than one class. The object of this is to perform all of this necessary boat service in a manner as economical as possible to the Government.

List of boats under control of artillery district commanders.

District and post.	Name of boat.	Class.	Rating in class.	Length in feet.	Service performed.
Portland:					
Fort Williams...	Henry Wilson.....	Passenger and freight steamer.	Second..	110	Quartermaster.
Do.....	Gen. Randol.....	Artillery district steamer.	First....	98	Artillery and submarine mine.
Do.....	No. 24.....	Distribution box launch.	do.....	32	Submarine mine.
Fort McKinley	Lieut. Drew.....	Steam launch.....	do.....	60	Artillery.
Fort Preble.....	Colonel Ramsey.....	do.....	Third....	30	Do.
Portsmouth:					
Fort Constitution.	Lieut. Grubbs.....	do.....	First....	60	Do.
Do.....	No. 27.....	Distribution box launch.	do.....	32	Submarine mine.
Boston:					
Fort Banks.....	Lieut. Bumpus....	Steam launch.....	do.....	60	Quartermaster and artillery.
Do.....	Gen. Anderson....	Artillery district steamer.	do.....	98	Artillery and submarine mine.
Do.....	No. 25.....	Distribution box launch.	do.....	32	Submarine mine.
Fort Andrews....	Colonel Mitchell..	Steam launch.....	Second..	45	Artillery.
Fort Warren.....	Captain De Hart..	do.....	Third....	40	Do.
Fort Strong.....	Lieut. Boutelle..	do.....	First....	50	Quartermaster.
Narragansett Bay:					
Fort Adams.....	Captain Drum.....	Tug.....	Third....	83	Quartermaster and artillery.
Do.....	General Arnold....	Artillery district steamer.	First....	98	Artillery and submarine mine.
Do.....	Lieut. Downes....	Gasoline launch....	do.....	60	Artillery.
Do.....	Lieut. Sater.....	do.....	Second..	40	Do.
Do.....	No. 30.....	Distribution box launch.	First....	32	Submarine mine.
New Bedford:					
Fort Rodman....	Lieut. Hartshorne..	Steam launch.....	do.....	60	Artillery.
Do.....	No. 31.....	Distribution box launch.	do.....	32	Submarine mine.
New London:					
Fort Trumbull..	General Nathanael Greene.	Passenger and freight steamer.	do.....	130	Quartermaster.
Do.....	Lieut. Schenck....	Steam launch.....	do.....	60	Do.
Fort H. G. Wright.	General Ayres.....	Artillery district steamer.	do.....	98	Artillery and submarine mine.
Do.....	Lieut. Ord.....	Steam launch.....	do.....	60	Artillery.
Do.....	No. 26.....	Distribution box launch.	do.....	32	Submarine mine.

List of boats under control of artillery district commanders—Continued.

District and post.	Name of boat.	Class.	Rating in class.	Length in feet.	Service performed.
Eastern New York:					
Fort Totten.....	Captain Rowell....	Artillery district steamer.	First....	86	Artillery and submarine mine.
Do.....	Captain Godfrey....	Tug.....	Fourth.....	30	Artillery.
Do.....	Colonel Hamilton..	Steam launch.....	Third.....	30	Do.
Do.....	No. 29.....	Distribution box launch.	First.....	32	Submarine mine.
Fort Schuyler....	Lieutenant Hazlett.	Steam launch.....	Third....	33	Artillery.
Southern New York:					
Fort Hancock....	General Brown.....	Artillery district steamer.	First....	98	Artillery and submarine mine.
Do.....	Captain Connell....	Steam launch.....	do.....	60	Artillery.
Do.....	No. 15.....	Distribution box launch.	do.....	32	Submarine mine.
Fort Wadsworth	Lieut. Lewis.....	Steam launch.....	do.....	59	Quartermaster and artillery.
Delaware:					
Fort Du Pont...	General Howe.....	Passenger and freight steamer.	Third....	75	Do.
Do.....	No. 32.....	Distribution box launch.	First....	32	Submarine mine.
Fort Mott.....	Lieutenant Crosby.	Steam launch.....	Third....	40	Artillery.
Baltimore:					
Fort Howard....	Sprigg Carroll.....	Passenger and freight steamer.	Second..	110	Quartermaster and artillery.
Do.....	Captain A. M. Wetherill.	Artillery district steamer.	First....	86	Artillery and submarine mine.
Do.....	Lieut. Gregg.....	Steam launch.....	do.....	60	Artillery.
Do.....	No. 33.....	Distribution box launch.	do.....	32	Submarine mine.
Potomac:					
Fort Washington.	General Robert Swartwout.	Passenger and freight steamer.	do.....	110	Quartermaster and artillery.
Do.....	Captain Wilhelm...	Gasolene launch....	do.....	60	Artillery.
Do.....	Lieut. Bernard....	Steam launch.....	do.....	55	Do.
Do.....	No. 28.....	Distribution box launch.	do.....	32	Submarine mine.
Chesapeake Bay:					
Fort Monroe....	Reno.....	Tug.....	Second..	96	Artillery.
Do.....	Lieut. Alonzo H. Cushing.	do.....	Third....	95	Do.
Do.....	No. 16.....	Distribution box launch.	First....	32	Submarine mine.
Do.....	No. 1.....	Distribution box launch (electric).	do.....	32	Do.
Cape Fear:					
Fort Caswell....	General Getty.....	Artillery district steamer.	do.....	98	Artillery and submarine mine.
Do.....	No. 14.....	Distribution box launch.	do.....	32	Submarine mine.
Charleston:					
Fort Moultrie...	General French....	Passenger and freight steamer.	Third....	92	Quartermaster.
Do.....	Gen. Brannan.....	Artillery district steamer.	First....	98	Artillery and submarine mine.
Do.....	Lieut. Lee.....	Steam launch.....	do.....	60	Artillery.
Do.....	No. 12.....	Distribution box launch.	do.....	32	Submarine mine.
Savannah:					
Fort Screven....	Gibbon.....	Tug.....	Third....	71	Quartermaster.
Do.....	General Jackson....	Artillery district steamer.	First....	98	Artillery and submarine mine.
Do.....	No. 4.....	Distribution box launch.	do.....	32	Submarine mine.
Fort Fremont....	Lieut. Smith.....	Steam launch.....	do.....	65	Quartermaster and artillery.
Do.....	Colonel Elder.....	do.....	do.....	57	Artillery.
Key West:					
Fort Taylor....	Major Forse.....	Artillery district steamer.	do.....	86	Artillery and submarine mine.
Do.....	Lieutenant Burnham.	Steam launch.....	Third....	30	Artillery.
Do.....	No. 3.....	Distribution box launch.	First....	32	Submarine mine.
Tampa:					
Fort Dade.....	General Timothy Pickering.	Passenger and freight launch.	Second..	110	Quartermaster and artillery.
Fort De Soto....	Lieut. Shipp.....	Steam launch.....	First....	60	Artillery.
Do.....	No. 7.....	Distribution box launch.	do.....	32	Submarine mine.

List of boats under control of artillery district commanders—Continued.

District and post.	Name of boat.	Class.	Rating in class.	Length in feet.	Service performed.
Pensacola:					
Fort Barrancas..	Poe.....	Steam lighter.....	Second..	92	Quartermaster and artillery.
Do.....	Capt. Morrison.....	Artillery district steamer.	First....	86	Artillery and submarine mine.
Do.....	Lieut. Neary.....	Gasoline launch.....	do.....	60	Artillery.
Do.....	Captain Page.....	Steam launch.....	Second..	45	Do.
Do.....	No. 11.....	Distribution box launch.	First....	32	Submarine mine.
Mobile:					
Fort Morgan.....	General R. N. Batchelder.	Passenger and freight steamer.	Second..	110	Quartermaster and artillery.
Do.....	Lieut. Koehler.....	Steam launch.....	First....	65	Do.
Do.....	Pleasanton.....	Gasoline launch.....	Third....	30	Artillery.
Do.....	No. 8.....	Distribution box launch.	First....	32	Submarine mine.
New Orleans:					
Fort St. Philip..	Mansfield.....	Steam launch.....	Second..	45	Quartermaster and artillery.
Do.....	No. 2.....	Distribution box launch.	First....	32	Submarine mine.
Galveston:					
San Diego:					
Fort Rosecrans..	Harris.....	Passenger and freight steamer.	Second..	105	Quartermaster and artillery.
Do.....	General De Russy..	Steam launch.....	First....	60	Do.
Do.....	No. 10.....	Distribution box launch.	do.....	32	Submarine mine.
San Francisco:					
Presidio.....	Capt. Barrett.....	Artillery district steamer.	do.....	98	Artillery and submarine mine.
Do.....	No. 23.....	Distribution box launch.	do.....	32	Submarine mine.
Columbia:					
Fort Stevens and Fort Columbia.....	Major Guy Howard	Passenger and freight steamer.	Third....	80	Quartermaster and artillery.
	Capt. Fornance.....	Artillery district steamer.	First....	98	Artillery and submarine mine.
	Springer.....	Steam launch.....	do.....	65	Quartermaster and artillery.
	No. 9.....	Distribution box launch.	do.....	32	Submarine mine.
Puget Sound:					
Fort Worden.....	Maj. Evan Thomas.	Passenger and freight steamer.	Second..	105	Quartermaster and artillery.
Fort Casey.....					
Fort Flagler.....					
Fort Ward.....					
Do.....	Lieut. Gurney.....	Steam launch.....	First....	65	Do.
	No. 13.....	Distribution box launch.	do.....	32	Submarine mine.
Manila Bay:					
Fort Mills ^a	Pampanga.....	(Loaned by Navy).	do.....		Artillery.
Do.....	Nos. 17, 18, 19, and 20.	Distribution box launches.	do.....	32	Submarine mine.
Subic Bay:					
Fort Wint ^a	Nos. 21 and 22.....	do.....	do.....	32	Do.
Honolulu:					
Fort Ruger.....	Nos. 5 and 6.....	do.....	do.....	32	Do.

^a Passenger and freight service performed by depot quartermaster, Manila.

In addition to the above there are certain vessels which are not under the control of the artillery district commanders, but which are used by the Quartermaster's Department for general passenger and freight service in important harbors. They are as follows:

List of boats under control of depot quartermasters used for supply of coast-artillery posts.

Harbors.	Coast-artillery posts supplied.	Name of boats.	Class.	Rating in class.	Length.
Boston.....	Forts Strong, Andrews, Warren, and Revere.	General Thomas S. Jesup.	Passenger and freight steamer.	First....	<i>Feet.</i> 130
Narragansett.....		The quartermaster and artillery service for Fort Greble is furnished by commercial boats under contract.			
New York.....	Forts Hancock, Hamilton, Wadsworth, Totten, and Schuyler.	General Joseph E. Johnston.	Passenger and freight steamer.	First....	130
		General Meigs.....	do.....	do.....	132
		Williams.....	Steam lighter.....	Second..	145
		Canby.....	do.....	do.....	97
		Colonel Wykoff.....	Tug.....	Third....	60
San Francisco.....	Forts Winfield Scott, Barry, and Baker.	General Mifflin.....	Passenger and freight steamer.	First....	130
		General McDowell.....	do.....	do.....	125
Puget Sound.....	Forts Worden, Casey, and Flagler.	Cartwright.....	do.....	Second..	104
Manila Bay.....	Fort Mills.....	{The passenger and freight service supplied by the depot quartermaster.			
Subic Bay.....	Fort Wint.....				

It will be seen from the above that the coast-artillery service is very well supplied with the boats on which it so peculiarly depends for its transportation and training. These boats, which are built and maintained by the Quartermaster's Department, have performed excellent service and have added in no small measure to the efficiency of the coast artillery.

The principal additions to the above boats that are now needed are a good passenger and freight steamer for each of the following districts: Puget Sound, Charleston, New Orleans, Manila and Subic bays. It is recommended that these vessels be supplied as soon as funds for their purchase become available.

COAST ARTILLERY SCHOOL.

The consolidation of the School of Submarine Defense, located previously at Fort Totten, N. Y., with the Artillery School at Fort Monroe, Va., was effected during the summer of 1908 and instruction under the consolidation began September 1 of that year. The new school has been designated the Coast Artillery School, and consists of the officers' division and the enlisted men's division.

In the officers' division there are two courses, designated as the regular course and the advanced course. For the regular course from 25 to 30 captains and lieutenants are detailed from the Coast Artillery Corps. For the advanced course 10 or 12 officers are selected from the honor graduates and distinguished graduates of the regular course.

The regular course embraces a thorough practical training in those technical subjects with which an officer of the coast artillery must be acquainted in order to perform efficiently his ordinary duties. It

includes the subjects of artillery proper, artillery defense, mine defense, explosives, electricity, and power.

The object of the advanced course is to amplify the work of the regular course with a view to improving the qualifications of the officers taking the advanced course for instructors in the school, fitting them for the more responsible positions in the Coast Artillery Corps, and preparing them for the course of instruction at the Army War College.

The class of 1909 consisted of 30 officers in the regular course and 10 in the advanced course. One officer in the advanced course was relieved from duty at the school and detailed as military attaché at Berlin prior to the completion of the course. The remaining officers in this course, and all of the 30 officers in the regular course, completed their work satisfactorily and received certificates of graduation. The excellence of the effort made by the students of this school is indicated by the fact that no student officer was required to take a final examination.

For the school year beginning September 1, 1909, 26 captains and lieutenants have been detailed for the regular class, and 10 have been detailed for the advanced class, either from the honor and distinguished graduates of this year's regular course and 2 from the honor graduates of previous classes.

The work of this division is practical in character, and comprises three distinct courses, the course for electrical specialists, the course for mechanical specialists, and the course for artillery specialists. A certificate of proficiency is given each enlisted student who satisfactorily completes one of these courses, and the holder of such certificate is eligible for appointment, respectively, as electrician-sergeant second class, fireman, or master gunner, in the Coast Artillery Corps.

The work of the division during the year has given most encouraging practical results. The enlisted students, almost without exception, by their zeal, faithfulness, and conscientious application, have shown a very clear appreciation of the advantages offered them; and the good effects of the school work upon the enlisted personnel of the coast artillery, as a whole, are already apparent. The actual service efficiency of our coast defenses must depend largely upon the successful operation, under war conditions, of power and electric plants, searchlights, fire-control lines and stations, mine plants, ammunition hoists, and other similar power installations, all of which involve the care and operation of mechanical and electrical machines of great variety and of considerable delicacy and complexity. The enlisted specialists in immediate charge of these machines and appliances must therefore be technically competent; and the standard of proficiency in each of the three courses of study embraced in this division of the school will be maintained sufficiently high to insure a body of men thoroughly qualified for this important work.

The class of 1909 comprised at the beginning of the year, October 1, 1908, 51 enlisted men, of whom 43 received certificates of proficiency.

Forty-six enlisted men have been detailed this year, beginning September 1, 1909, to take the courses, 20 to take the course for electrical specialists, 13 that for mechanical specialists, and 13 that for artillery specialists.

During the year new school buildings have been completed for both divisions of the school and also for a school library. **New school buildings.** These buildings are well adapted to the needs of the school, and the facilities thus provided will do much to increase the efficiency of the courses of instruction.

Under the provisions of an act of Congress approved March 3, 1909, General Orders, No. 118, War Department, current series, authorized the organization of the "Coast Artillery School Detachment," consisting of 75 **School detachment.** enlisted men of various grades from master electrician to private. They are to perform the duties connected with the school heretofore performed by selected noncommissioned staff officers from the coast artillery at large and by noncommissioned officers and privates on extra duty selected from the organizations serving at Fort Monroe.

The work of the school during the year has in every way been most satisfactory, and all officers and enlisted men connected therewith are deserving of much praise for their good work.

COAST ARTILLERY BOARD.

Such coast artillery officers as are designated by the War Department for duty on the board constitute the Coast Artillery Board, which is stationed at Fort Monroe, Va., and to which are referred, from time to time, all subjects pertaining to the coast artillery upon which the War Department or the Chief of Coast Artillery may desire the board's opinion and recommendation. As a factor in the technical progress of the coast artillery, the Coast Artillery Board is second only to the Coast Artillery School. At the present time the board consists of one major, who is also director of the department of electricity and mine defense, Coast Artillery School; one captain, in command of a 12-inch mortar battery; one captain, in command of a 12-inch gun battery; one captain, in command of a 10-inch gun battery; and one captain, as member and recorder, who is also secretary of the Coast Artillery School. For the consideration of ballistic questions only, one captain specially qualified in this subject is an additional member of the board.

Many important subjects bearing on all branches of coast artillery work have been referred to the board during the past **Subjects considered.** year. A number of these have necessitated a large amount of experimental work on the part of the board, as well as very extensive reports. Among the important subjects considered were the following:

For this test instruments were submitted by Barr & Stroud, Glasgow, Scotland, and also by two American firms. **Competitive test of self-contained horizontal-base range finders.** In making the test to determine the best instrument observations were made on fixed and moving objects by daylight and at night. The actual range for each target was determined by means of a long horizontal base line, and this range was compared with those determined simultaneously by the instruments under test. As a result of the test, it was found that the Barr & Stroud 9-foot horizontal-base instrument is well adapted as a self-contained range finder to be installed as the typical fire-control instrument for rapid-fire batteries, and as an emergency instrument for large caliber guns.

For this test a gold-plated metallic mirror, a silver-plated glass mirror, and a Monel (metallic) mirror, with three types of electrical control, were installed and observations were taken on a tug with the various lights.

Competitive test of 60-inch searchlight outfits.

It was found that the metallic mirrors were inferior to the silvered-glass mirror, and that the Monel mirror was superior to the gold-plated mirror. The test showed that two methods of searchlight control excellent for long-distance control have been developed. A Rosenberg balancer set and a Rosenberg motor generator set were also tested with a view to their adoption for supplying current to the arc. It was found that a rheostat properly constructed gave better service than either set tested. As a result of these experiments many improvements in searchlight material were developed, and as a further result it is assured that our coast defense will be equipped in the future with a searchlight service far superior to anything which it has had in the past.

As a result of a test made by the board at Fort Wadsworth, N. Y., in 1907, it was decided to adopt the Lewis depression position finder as the standard depression type of range finder; a shop test for this instrument has since been developed which will insure to the service accurately tested position finders.

Test of depression position finders.

During 1908 a material target was developed, and before the end of 1909 targets will be supplied to all artillery districts which will show by the actual holes in a net the hits made by gun batteries. Heretofore during target practice splashes made by shots have been located and hits determined by observation of the splashes. While this method was sufficient for determining the relative efficiency of the various batteries firing, it is believed that a great impetus will now be given to the interest in target practice, since each battery will be able to count the actual hits made by it on a material target.

Material target.

The board has finally determined all the conditions necessary for the proper functioning of automatic anchors. As a result, automatic anchors have been ordered both for home and insular ports, which will enable mines to be planted rapidly in any depth of water without knowing the depth beforehand. This is specially important in connection with efficient submarine mining, and the satisfactory solution of the automatic anchor problem is most gratifying.

Automatic anchors for submarine mines.

Competitive tests were made with oil and gasoline engines, with the result that a direct-connected gasoline motor has been determined upon which will undoubtedly give highly satisfactory service.

Test of gasoline motors for adoption in the mine service.

Experimental firings were conducted by the board at Fort Caswell, N. C., with a view to developing rules and regulations for night practice and a fire control system for rapid-fire guns. As a result of these experiments satisfactory regulations for night practice and also the details for an efficient fire control system for rapid-fire guns have been decided upon.

Fire control system for rapid-fire guns.

The board has completed the revision of drill regulations for the coast artillery and within a short time there will be ^{Coast artillery drill regulations.} in the hands of coast artillery personnel everywhere drill regulations embracing all the developments in material and drill of the last few years. These developments are of special interest in coast artillery work, and it is thought that these drill regulations will be far in advance of any manual heretofore issued to the coast artillery service.

Besides the above, many other subjects having in view the improvement of coast artillery material and work were also considered and reported upon by the board. For its work during the year the board is specially deserving of credit by all interested in the development of coast defense.

THE TORPEDO DEPOT.

The material required for the submarine mine defense of the important harbors of the United States and insular possessions is supplied from the torpedo depot at Fort Totten, N. Y., by the disbursing officer, who purchases and issues this material under rules prescribed by the Secretary of War.

The recommendations of the Taft Board in its report of February 1, 1906, included the mine defense of 41 posts in the United States and 8 in the insular possessions.

The mine material for 37 posts in the United States and 3 in the insular possessions has already been provided from appropriations made since February 1, 1906, leaving 4 posts in the United States and 5 in the insular possessions which will still be unprovided with the proper mine equipment.

The depot has continued to purchase new mine equipment during the past year and to supply the necessary material for the care and preservation of existing mine equipments; it has also supplied 24 artillery districts with equipments for use on the auxiliary mine planters, which are referred to in this report under the heading "Boat service for coast artillery."

The depot was charged with the design and construction of a new submarine exhibit for the use of the War Department at exhibitions; the exhibit was completed, set up, and was in successful operation before the opening day at the Alaska-Yukon-Pacific Exposition at Seattle.

With the money available for the fiscal year 1909-10 it is proposed to continue the purchase of submarine mine material for the United States.

There being no appropriation this year for the purchase of submarine mine material for insular posts nothing further can be accomplished toward equipping the 5 posts in the insular possessions yet remaining of those recommended by the Taft Board for submarine mine defense.

Very respectfully,

ARTHUR MURRAY,
Brigadier-General, Chief of Coast Artillery.

The CHIEF OF STAFF, U. S. ARMY.

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